U. S. DEPARTMENT OF COMMERCE
BUREAU OF FISHERIES

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# REPORT

OF THE

# UNITED STATES COMMISSIONER OF FISHERIES

## FOR THE FISCAL YEAR 1939

WITH

## APPENDIXES

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CHARLES E. JACKSON
ACTING COMMISSIONER

UNITED STATES
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## NOTE

The first section of this volume, entitled "Bureau of Fisheries," constitutes what was known in years prior to 1933 as "Report of the Commissioner of Fisheries." Since then, in the interests of economy, it is a reprint from the "Annual Report of the Secretary of Commerce." The pagination, therefore, is the same as that of the Secretary's Report, rather than beginning with page I.

This report covers two administrations of the Bureau of Fisheries. Commissioner Frank T. Bell resigned, effective March 21, 1939, and the duties of that office were assumed by Charles E. Jackson, as Acting Commissioner, on that date.

4023
148

## CONTENTS

Page

BUREAU OF FISHERIES. By Charles E. Jackson. (Issued Dec. 30, 1939.) (See p. II.) ---------- 135–163

PROGRESS IN BIOLOGICAL INQUIRIES, 1938. By Elmer Higgins, Appendix I. Administrative Report No. 35. (Issued Dec. 9, 1939.) ---------- 1–81

ALASKA FISHERY AND FUR-SEAL INDUSTRIES IN 1938. By Ward T. Bower. Appendix II. Administrative Report No. 36. (Issued June 3, 1940.) ---------- 83–168

FISHERIES INDUSTRIES OF THE UNITED STATES, 1938. By R. H. Fiedler. Appendix III. Administrative Report No. 37. (Issued May 28, 1940.) ---------- 169–554

PROPAGATION AND DISTRIBUTION OF FOOD FISHES, 1939. By Glen C. Leach, M. C. James, and E. J. Douglass. Appendix IV. Administrative Report No. 38. (Issued Feb. 24, 1941.) ---------- 555–598

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# U. S. DEPARTMENT OF COMMERCE

## BUREAU OF FISHERIES

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### HEADQUARTERS STAFF, 1938-39

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*Acting Commissioner*

Charles E. Jackson

*Administrative Assistant.*—John R. Gardner.

*Chiefs of Divisions:*

- *Fish Culture.*—Glen C. Leach.
- *Inquiry Respecting Food Fishes.*—Elmer Higgins.
- *Fishery Industries.*—R. H. Fiedler.
- *Alaska Service.*—Ward T. Bower.
- *Black Bass and Anglers.*—Talbott Denmead.

*Director of Aquarium.*—Fred G. Orsinger.

*Editor.*—Harold B. Carr.

*Librarian.*—Gladys Johnson.

Publications.—Barbara Aller.

[Reprint from the Annual Report of the Secretary of Commerce, 1939]

# BUREAU OF FISHERIES

Available statistics indicate that there was a decrease in the volume but an increase in the value of fishery products taken in the United States and Alaska during 1937 as compared with the preceding year. Data on the catch were collected for both 1936 and 1937 in the Chesapeake, South Atlantic and Gulf, Pacific, and Lake States and in Alaska. The combined catch in these sections alone shows a decrease of 13 percent in volume but an increase of 7 percent in value. Decreased catches were made in each of the five geographical sections; however, the principal reductions occurred in the Pacific Coast States where greatly reduced catches of pilchards were taken, and in Alaska where there was a large decline in the catch of salmon.

The total catch of fishery products in the United States and Alaska, as based on the most recent surveys, amounted to 4,352,549,000 pounds, valued at $100,845,000. About 130,000 fishermen were employed in making this catch.

The production of canned fishery products in the United States and Alaska during 1937 amounted to 742,197,000 pounds, valued at $105,175,000; the output of byproducts was valued at $36,804,000; the production of frozen fishery products, excluding packaged products, amounted to 103,112,000 pounds, estimated to be valued at $8,800,000; and fresh and frozen packaged fish and shellfish, 201,803,000 pounds, valued at $27,678,000. Based on surveys for previous years, the production of cured fishery products amounted to 104,339,000 pounds, valued at $15,635,000. It is estimated that about 686,000,000 pounds of fresh fishery products (excluding packaged fish and shellfish), valued at about $57,000,000, was marketed during 1937. The total marketed value to domestic primary handlers of all fishery products in 1937 is estimated at $251,000,000.

Fishery products imported for consumption were valued at $50,636,000 and domestic exports were valued at $14,567,000.

The value of the production of canned fishery products in all sections increased 11 percent as compared with 1936; byproducts increased 5 percent; frozen fish, about 1 percent; and packaged fish, 3 percent.

## INTERNATIONAL RELATIONS

### HALIBUT INVESTIGATIONS

The International Fisheries Commission continued the investigation and regulation of the Pacific halibut fishery, under authority of the treaty of Jauary 29, 1937, between the United States and Canada.

In fulfillment of its regulatory duties, the Commission recorded the catch from each regulatory area, forecast and announced the date of attainment of each area limit, and closed the areas accordingly. It opened the 1939 fishing season on April 1 under regulations essentially unchanged from those of the preceding year.

Areas 1 and 2 were closed to halibut fishing in 1938 at midnight of July 29, with catches of approximately 706,000 and 22,923,000 pounds, respectively. Areas 3 and 4 were closed at midnight of October 29, with catches of 25,591,000 and 0 pounds, respectively.

The investigations of the Commission's scientific staff were continued along the lines necessary for fulfillment of the purpose of the treaty. Current biological and statistical data, which form a system of observation of the changes occurring in the stocks of halibut as a result of regulation and a necessary basis for the continued rational control of the fishery, were collected and analyzed. The collection of biological data made necessary the operation of a vessel at sea.

The abundance of halibut, as indicated by the catch per unit of fishing effort, showed a further increase all along the coast in 1938. In area 2, between Cape Spencer in Alaska and Willipa Bay in Washington, the abundance was 15 percent greater than in 1937, 100 percent greater than in 1930. In area 3, between Cape Spencer and the Aleutian Islands, it was 3.5 percent greater than the previous year and 77 percent greater than in 1930, the last year of unrestricted fishing.

Sampling of the stocks of marketable halibut by means of market measurements was continued to determine the changes occurring in their composition as a result of regulation. For the first time since the Commission began regulating the fishery, market measurements failed to show an increase in the size of the fish landed or in the proportion of mature fish on the more depleted banks of area 2. The maximum proportion of larger sizes from the stock of young available at the time regulation began appears to have been reached and a further increase in the larger sizes may not occur until the increasing stock of young has had time to grow up.

Observation of the effect of regulation on the production of spawn in area 2 was continued by means of net hauls taken at sea during the winter spawning season. Analysis of the catches of eggs indicated that the increase observed in their abundance from 1934–35 to 1936–37 was not continued in 1937–38 and 1938–39. No special significance can yet be attributed to the failure of production in the latter 2 years to equal the high level of 1936–37, because of the variations that occur normally from year to year among marine species, but it is to be suspected that it may be associated with the changes in size composition mentioned above.

## INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

Work of an experimental and preliminary nature, to establish facts upon which the permanent program could be based, was carried on during the 1938 season. A compilation and analysis of the great mass of existing records of the sockeye run to the Fraser River was nearing completion by the end of the year. A survey of the spawning grounds was begun. The adult migrants in salt water were tagged and extensive recoveries made on the spawning grounds.

The Commission held its third meeting September 23–24 in Vancouver, B. C. The program of investigation, then under way, was discussed and that for 1939 approved. In February 1939, William A. Found resigned and was replaced by A. J. Whitmore.

## JAPANESE ACTIVITIES IN THE BRISTOL BAY FISHERY

Japanese fishery operations in Bristol Bay in 1939, the tenth consecutive season in which such activities have been carried on, were confined to the catching and canning of king or spider crabs, and only one floating cannery, together with auxiliary craft, was employed. This indicates a continued adherence on the part of the Japanese Government to the assurance given in the spring of 1938 that its official survey of the salmon in Bristol Bay would be suspended and that it would issue no license to vessels to take salmon in those waters.

## CONSERVATION OF WHALES

The Protocol of June 24, 1938, which amends in certain particulars the International Agreement for the Regulation of Whaling, signed at London on June 8, 1937, came into force as to the United States on March 30, 1939, and was proclaimed by the President on April 8, 1939.

The principal provisions of the Protocol of 1938, which are advances in the measures of conservation of the whale stock of the world provided in the agreement of 1937, are as follows:

(1) A prohibition against the taking or treating of humpback whales south of 40° south latitude by factory ships or whale catchers attached thereto from October 1, 1938, to September 30, 1939. (Article 1.)

(2) The establishment of a sanctuary for baleen whales south of 40° south latitude between 70° west longitude and 160° west longitude for a period of 2 years from December 3, 1938. (Article 2.)

(3) A clarification of provisions in articles 7 and 8 of the agreement of 1937, which had given rise to conflicting interpretations, so as to make clear that no factory ship which has been used for the purpose of treating baleen whales south of 40° south latitude shall be used for that purpose elsewhere within 12 months from the end of the open season; that only factory ships which have operated within the territorial waters in 1937 shall so operate after the signature of the protocol; that such ships shall be treated as land stations, shall remain moored, and shall not operate more than 6 months in any 12-month period; and that such operations shall be continuous. (Article 3.)

## NORTH AMERICAN COUNCIL ON FISHERY INVESTIGATIONS

The twenty-fifth meeting of the North American Council on Fishery Investigations was held in Boston, Mass., October 4–7, 1938. Representatives from Canada, Newfoundland, and the United States were present. At the invitation of the Council, members of the Fishery Advisory Committee of the Department of Commerce and other leaders of the fishing industry attended a general session on

October 5 for a discussion of fishery problems in the North Atlantic area. The general program of fishery investigations being conducted by Canada, Newfoundland, and the United States was presented.

In the sectional committee meetings dealing with groundfish investigations, shorefish studies, hydrographic research, and fishery statistics, nearly a score of investigators presented reports on their work, affording members of the Council a summary review of progress during the year in these fields and permitting them to modify their official program accordingly. Important advances were reported in the study of the cod fishery being prosecuted by Canada, the lobster studies in Newfoundland, and the investigations in the United States leading to a proposal for effective management of the haddock fishery.

### INTERSTATE COOPERATION IN FISHERY MANAGEMENT

As a result of efforts of the Council of State Governments in cooperation with the Bureau of Fisheries and with fishery administrators of the various States concerned, progress has been made toward the solution of fishery problems in the Great Lakes and on the Atlantic coast.

The Interstate Committee on Great Lakes Fisheries, appointed at the conference held under the auspices of the Council of State Governments in February 1938, met in Chicago on December 5. An international treaty to bring about uniform regulation of Great Lakes fisheries was again endorsed. Pending the adoption of an international treaty, however, the Committee recommended the adoption of an interstate compact for the regulation of United States fisheries in the Great Lakes. The formation of such a compact has been authorized by the Congress of the United States. The Committee also urged that State fish and game commissioners be given discretionary power to regulate fisheries without legislative action.

At the Eastern States Conservation Conference held in New York November 19, a resolution was unanimously adopted petitioning Congress to grant permission to States bordering on the Atlantic coast to enter into a compact for the protection of migratory fishes in territorial waters. A committee was appointed to prepare a draft of the compact for submission to the States.

### FISHERY ADVISORY COMMITTEE

The Fishery Advisory Committee met in Boston, Mass., on October 5, 1938, in conjunction with the National Fisheries Convention in session during the week. Discussion centered largely around problems of production and merchandizing fishery products. On October 5, members also attended a general session of the North American Council on Fishery Investigations for consideration of fishery problems in the North Atlantic area.

The Committee met in Washington, D. C., January 30–31, 1939. Special problems challenging the industry at this time, recommended by the Committee for further research, are improvements in methods of transporting iced and frozen fishes and more complete utilization of the waste products of the fisheries. Inasmuch as fishery products constitute a wholesome and nutritious food which contains mineral elements essential to health that are not readily available in many foods of land origin, an even flow of fishery products from producer to consumer is essential to the public interest.

## DOMESTIC RELATIONS

### COOPERATION WITH FEDERAL, STATE, AND OTHER AGENCIES

Cooperation was given by members of the Bureau technological staff to chemists and bacteriologists of the Food and Drug Administration, U. S. Department of Agriculture, in connection with the development and application of tests on methods of determining the quality and constituents of various fishery products; and to the Extension Service of the U. S. Department of Agriculture in connection with the conduct of demonstrations and practical instruction on the preservation of fishery products and more complete utilization in the diet of the excellent food value of fish and shellfish.

Members of the economic and marketing staff of the Division of Fishery Industries cooperated with the Department of Labor in holding conferences with fishermen's unions and associations to settle disputes. The Division also worked with various Federal agencies in obtaining statistical data on our fisheries. These included the Bureau of Agricultural Economics, the health authorities in Washington, D. C., and the Bureau of the Census.

The Bureau has carried on cooperative investigations in technological work with several colleges, universities, and other State institutions. Outstanding among these are Washington State College, Pullman, Wash.; University of Washington, Seattle, Wash.; University of Maryland and Maryland State Agricultural Experiment Station, College Park, Md.

In the conduct of its statistical and marketing work some form of cooperation is given the Bureau in virtually every State where commercial fishing is prosecuted. This cooperation probably reached its greatest development in the States bordering on the Great Lakes and in the Pacific Coast and Chesapeake Bay States.

The Division of Fish Culture maintains the closest liaison with the State fish and game departments and other Federal agencies concerned with the conservation of fish. There has been close contact between the Bureau's representatives, the Bureau of Reclamation, and fisheries officials of the State of Washington with reference to the development of plans for the artificial propagation of the salmon run to be affected by the completion of the huge Grand Coulee Dam.

There has been continued expansion of the policy of routing fish applications to the State departments for check and approval before deliveries are made. The natural consequence of this has been a development of arrangements for the States to deliver the fish with their own equipment and this has been practiced in a number of instances.

The exchange of eggs and fish by the Bureau has been of mutual benefit, particularly in Michigan and Minnesota. In the Western States also, particularly in Oregon, the fish-cultural and fish-distribution work is closely coordinated, with resultant economies to both the State and the Federal Governments.

In the Tennessee Valley area, three-way agreements between the Bureau of Fisheries, the Tennessee Valley Authority, and the States of Alabama, Tennessee, and North Carolina have been made effective or are being negotiated. Under such agreements the T. V. A. has established and built hatcheries and rearing facilities which the Bureau is to operate. The fish produced are to be distributed by the States in that part of the Tennessee Valley area which are included within the respective State boundaries.

The work with the National Park Service has continued in a constructive way and at the close of the year the Park Service was constructing a new hatchery at Glacier Park with subsequent operations to be managed by the Bureau.

In view of the tremendous responsibility upon the Forest Service of the Department of Agriculture for the maintenance of fishing in the national forests, the Bureau has enjoyed unusual cooperation with that agency. A new trout-rearing unit was under construction in the Allegheny National Forest in Pennsylvania, under plans developed and approved by the Bureau with the expectation that it would be operated by this Bureau upon completion.

The State of North Dakota Fish and Game Department donated the site for a new hatchery at Valley City. At St. Louis, Mo., the city officials have approved the construction, at no cost to the Bureau, of a modern hatchery and service building in the Forest Park hatchery. This series of ponds was taken over by the Bureau for operation shortly before the start of the fiscal year 1939 and the results have been most favorable. The State of Minnesota donated a tract of land for a hatchery at New London and furnished the services of surveyors and engineers in acquiring additional property. The site for a new hatchery, at Farlington, Kans., was more easily acquired by reason of the donation of water rights to a State-owned lake. The State of Ohio purchased and donated to the Bureau a splendid location for the new hatchery to be constructed in that State.

### CONSTRUCTION ACTIVITIES

At the start of the fiscal year there was being undertaken an extensive program of hatchery development and improvement financed by an allocation of $808,500 from the Public Works Administration, and $500,050 from the Works Progress Administration.

These funds were allocated to more than 70 different field projects, involving complete rehabilitation of some of the older hatcheries and enlargement and improvement of the newer establishments. The work involved replacement of pipe lines or complete construction of new water-supply systems; construction, repair, and improvement of buildings; construction of ponds; installation of new equipment; and general landscaping. In some instances there was a 100-percent increase in the productive capacity of a station. The Public Works Administration funds were largely used for the purchase of materials, supplies, and equipment; while the labor, practically all from relief sources, was a contribution from the Works Progress Administration allotment.

The principal development of an entirely new nature was the construction of a pondfish hatchery at the Roy Inks Dam on the lower

Colorado River in Texas. The site was furnished by the Lower Colorado River Authority and the construction was supervised by the Bureau. It was financed by a portion of the P. W. A. allotment and by the assignment of N. Y. A. labor. At the close of the year this project was virtually completed and some of the ponds were stocked with fingerling bass.

Great improvements were effected at the Fort Worth station, where an additional tract of land was donated by the city of Fort Worth and utilized for the development of additional ponds.

The Charlevoix, Mich., hatchery, which had been closed since 1933, was entirely rehabilitated and equipped for the rearing of lake trout fingerling.

In several instances the State W. P. A. projects were in effect, also making possible additional improvements. An outstanding example of this method was at Guttenberg, Iowa, where initial work on a very large bass and pondfish hatchery within the Upper Mississippi River Wild Life and Fish Refuge was undertaken. Curtailment of the scope of the C. C. C. resulted in some restriction of the construction work prosecuted by this agency. A limited number of assignees were held at work at Lamar, Pa., but the C. C. C. development at the York Pond, N. H., station was terminated. However, it was possible to continue developments there by utilization of emergency funds allotted directly to the Bureau.

In addition to the improvements made possible by direct cash allotments to the Bureau, the Appropriation Act for 1939 carried the sum of $155,000, provided for the construction of new hatcheries in Kansas, North Dakota, Minnesota, and Ohio. A suitable site was located at Valley City, N. Dak., and, at the close of the fiscal year, the hatchery was approximately 75 percent completed, although not in readiness for operation. Sites were selected at Hebron, Ohio, Farlington, Kans., and New London, Minn., but various difficulties were encountered in acquiring clear titles to these sites, with resultant delay in starting actual construction. At the close of the year, however, preparations were being made to initiate the construction phase at each of these locations. The funds appropriated for these hatcheries were continued available during the fiscal year 1940.

By means of funds allotted from the Public Works Administration and the Works Progress Administration, improvements were also made during the year to the technological byproducts laboratory building and the chemical laboratories in Seattle, Wash.

## ALASKA FISHERIES SERVICE

### ADMINISTRATION OF FISHERY LAWS AND REGULATIONS

Careful observations of the runs and escapement of salmon were made in all fishing districts, and regulations were modified as seemed desirable. In general, the salmon runs were satisfactory, and most of the changes in regulations during the season were relaxations to permit additional commercial fishing in specified localities. The Commissioner of Fisheries spent several weeks in Alaska inspecting the fishery and fur-seal activities.

Revised regulations, issued on February 11, to be effective in 1939 contained few changes of major importance. The salmon fishing season was shortened in parts of southeast and central Alaska, and in some localities the season was extended slightly, in view of the satisfactory runs. In order to promote the use of claims for outlying areas that had previously been but little exploited, the limitation on the pack for the Seward-Katalla district as a whole was increased, while a limitation was placed on the output of certain well-known beds in the district. Some additional restrictions were placed on commercial fishing for herring and crabs.

Two 15-year leases of oyster bottoms in Alaska were executed during the fiscal year 1939 under the authority granted by the act of August 2, 1937, for the protection of oyster culture in Alaska. Liberal leasing terms have been established in order to encourage the development of this industry.

Fourteen vessels of the Bureau, five speedboats, and a number of other small power boats were used in the patrol of the fishing grounds. The personnel identified with fishery-protective work numbered 209, including wardens, stream guards, weir operators, vessel crews, and biologists. Chartered airplane service was used to some extent to supplement the vessel patrol, and also for surveys of the spawning grounds and transportation of officials to isolated districts.

Attention was given to the reclaiming of former spawning areas that had become inaccessible to the salmon by reason of accumulated débris from slides and windfalls. This work was largely incidental to the patrol of the fishing grounds. The destruction of predatory trout that feed upon salmon eggs and fry was continued in the Bristol Bay and Cook Inlet regions through funds supplied by the Territory and by local salmon packers. An appropriation of $25,000 was made by the Territorial Legislature in 1939 to continue the improvement of salmon streams and the payment of bounty on predatory trout during the next 2 years.

Biological studies of the salmon and herring were continued, the work in connection with the former being extended to include a comprehensive investigation of the red-salmon fisheries of Bristol Bay. Further studies concerning the effect of predatory trout in reducing the numbers of young salmon were carried on in the Kodiak region. Weirs for counting the escapement of spawning salmon were operated in 11 representative salmon streams.

## PRODUCTS OF THE FISHERIES

Notwithstanding the fact that several plants stood idle because of prolonged labor negotiations in the spring and the consequent delay in preparation for the season's operations, the volume of fishery products in Alaska compared favorably with the average for recent years. An outstanding feature was the unusual abundance of red salmon in the Bristol Bay area, resulting in the largest catch ever recorded for that region.

The total output of Alaska fishery products in 1938 was 446,664,000 pounds, valued at $42,870,000, as compared with 452,545,000 pounds, valued at $51,743,000 in 1937. The estimated value of the 1938 catch to the fishermen was approximately $12,040,000, or about $2,198,000 less than in the preceding year. There were 28,084 persons employed in the various branches of the industry, as against 30,331 in 1937.

Salmon products comprised approximately 78 percent in quantity and 91 percent in value of the total output of the Alaska fisheries in 1938. Ninety-three percent of the salmon products consisted of canned salmon, the pack amounting to 6,807,000 cases, or 326,736,000 pounds, valued at $36,637,000. Red salmon represented 37 percent and pinks 47 percent of the total pack of canned salmon, as against 32 percent and 54 percent, respectively, in 1937. As compared with the pack of the preceding year, the output of canned salmon in 1938 showed an increase of 2 percent in quantity but a decrease of nearly 18 percent in value. Ninety-eight canneries were operated, or 15 less than in 1937, and the number of persons employed in the salmon-canning industry dropped from 24,865 in 1937 to 22,280 in 1938.

Seventeen herring plants were operated, as compared with 20 in the previous year, and the quantity of herring products declined from the peak production of 1937, although continuing at a comparatively high level. Other fisheries in which there was a decreased production included the whale, shrimp, and crab industries. Only one whaling station was operated in Alaska in 1938. Halibut landings of the Alaska fleet showed a slight increase in volume, as did also cod, clam, and a few other minor fishery products.

## ALASKA FUR-SEAL SERVICE

### GENERAL ACTIVITIES

Sealing and foxing operations at the Pribilof Islands were carried on, as heretofore, by the natives under the supervision of a staff of 13 regular employees and a number of sealing assistants. Approximately 80 Aleutian natives also were employed during the summer in connection with sealing activities, and 23 skilled employees of the Fouke Fur Co. were at the islands for several weeks to assist in curing and packing the sealskins.

The byproducts plant on St. Paul Island was operated for the utilization of fur-seal carcasses. Products for the 1938 season amounted to 30,587 gallons of oil and 357,222 pounds of meal. These products, other than small quantities retained at the islands for fox feed, were shipped to Seattle, where the oil was sold for commercial use and the meal was transferred to the Division of Fish Culture for feeding fish at the hatcheries.

On St. George Island a warehouse and three new cottages for natives were built, and improved roads were extended about a mile. Considerable resurfacing of roads also was done there and on St. Paul Island. Four cabins and a powerhouse, as well as some new equipment, were added to the substation for sea-otter investigations and patrol in the western Aleutians.

Valuable cooperative service was rendered by the Navy Department in assibning the U. S. S. *Vega* to carry the annual shipment of supplies to the Pribilof Islands, and by the Coast Guard in patrolling waters of the North Pacific and Bering Sea for the protection of fur seals and sea otters.

Delivery of 8,755 fur-seal skins, or 15 percent of the take on the Pribilof Islands in 1938, was made to an agent of the Canadian Government at Seattle. The Japanese Government, entitled to a like number under the provisions of the fur-seal treaty of 1911, continued the practice of sharing in the proceeds of sale, rather than taking actual delivery of the skins.

Two hundred and ten fur-seal skins taken by the Japanese Government on Robben Island in 1938 were allotted to the United States as its share under the treaty provisions and were shipped to the Department's selling agents at St. Louis, Mo., for processing and sale.

A new contract for the processing and sale of Government-owned fur-seal and other skins was entered into by the Acting Secretary of Commerce and the Fouke Fur Co., St. Louis, Mo., under date of June 9, 1939, covering sealskins taken in 1939 and the following season, and thereafter until the contract is terminated by either party.

### SEAL HERD

The computed number of animals in the Pribilof Islands fur-seal herd on August 10, 1938, was 1,872,438, an increase of 33,319, or about 2 percent over the corresponding figure for the preceding year. This comparatively small increase is accounted for by the fact that it has been found necessary to apply higher mortality rates for animals in their first year at sea and to make adjustments accordingly in respect to certain age groups.

### TAKE OF SEALSKINS

In the calendar year 1938 there were taken on the Pribilof Islands 58,364 fur-seal skins, of which 46,082 were from St. Paul Island and 12,282 from St. George Island. This was an increase of 3,184 over the total take in 1937. Insofar as possible, killings were confined to 3-year-old males. A suitable number of this age class was reserved for breeding stock.

### SALE OF SEALSKINS

Two public auction sales of fur-seal skins were held at St. Louis in the fiscal year 1939. At the sale on October 10, 1938, there were sold 9,754 skins dyed black, 14,490 skins dyed safari brown, and 46 miscellaneous skins for a gross total of $509,293.75. On May 22, 1939, 7,800 skins dyed black and 12,720 dyed safari brown brought a gross sum of $344,338.75.

Sealskins sold at private sales under special authorization by the Secretary of Commerce consisted of 324 dyed black, 487 dyed safari brown, 1 partly processed, and 73 raw-salted skins, which brought a gross total of $17,713. In all, 45,695 fur-seal skins were sold for the account of the Government in the fiscal year 1939, for a total gross sum of $871,345.50.

### FOXES

The care of blue foxes on the Pribilof Islands is an important seasonal activity, requiring attention only during the winter months when sealing operations are at a minimum. During the 1938–39 season 219 blue and 5 white foxskins were taken on St. Paul Island and 799 blue and 6 white foxskins were taken on St. George Island, a total of 1,029. Suitable reserves for breeding purposes were made on both islands. Eight hundred and forty-seven blue and 16 white foxskins, taken on the Pribilof Islands in the 1937–38 season, were sold at public auction in the fiscal year 1939. The blue foxskins brought $16,452.50 and the white skins brought $216, a total gross sum of $16,668.50.

### FUR-SEAL SKINS TAKEN BY NATIVES

The North Pacific Sealing Convention of July 7, 1911, provides that aborigines dwelling along the Pacific coast may take fur seals under restricted conditions. In 1938 Indians under the jurisdiction of the United States took 184 sealskins and Canadian Indians took 1,367 sealskins, which were duly authenticated by Government officials of the two countries.

### FUR-SEAL PATROL

Vessels of the Coast Guard were again assigned by the Secretary of the Treasury to patrol waters of the North Pacific and Bering Sea for the protection of the fur seals and sea otters. One vessel of the Bureau of Fisheries also participated in the fur-seal patrol during the northward migration of the herd.

### PROTECTION OF SEA OTTERS, WALRUSES, AND SEA LIONS

New regulations for the protection of walruses and sea lions were issued on June 29, 1939, extending the closed season on these animals until June 30, 1941, while continuing permission for their capture under certain specified conditions. The killing of sea otters is prohibited at all times.

## PROPAGATION AND DISTRIBUTION OF FOOD AND GAME FISHES

The preliminary records of production for the hatcheries operated by the Division of Fish Culture show an output of 8,094,000,000 eggs, fry, and larger fish. With the 1938 production amounting to slightly over 8,121,000,000 it is evident that there was little variation in the scope and magnitude of the activities. Forty-six species were handled at the hatcheries and in the rescue fields. Among the individual species an increase was recorded for 16. As usual the greatest increase was shown with the commercial or semicommercial species. The Bureau initiated the propagation of Kentucky bass, which had not previously been handled at its hatcheries. No glut herring, carp, or humped-back salmon were handled at the hatcheries during the fiscal year 1939. The conduct of repair and improvement work rendered some of the fish-cultural facilities inoperative during the season with consequent curtailment of production of fish. The output of brook-trout eggs was unusually low because of the fact that a disease epidemic at the York Pond, N. H., station, the principal point of production for this species, necessitated a complete elimination of all stock on hand and reduced the distribution to negligible proportions. The production of fingerlings and large fish was 84,459,000, which presents a sharp drop in comparison with the previous year when 119,000,000 were handled. This, however, does not indicate any limitation upon the hatcheries' activities but is rather a reflection of the virtual cessation of rescue and salvage work in the Upper Mississippi River Wild Life and Fish Refuge, from which source the fingerlings of warm-water species have heretofore been obtained in large numbers. The number of unfilled applications for game species as submitted by private individuals and conservation organizations was, at the close of the year, as low as at any time within recent years.

## PROPAGATION OF COMMERCIAL SPECIES

The three hatcheries in New England propagating commercial species of the inshore waters were operated with increased intensity with the result that there was a noticeable increase in the production of cod, haddock, and flatfish. Pollock were produced in reduced quantities and the output of lobster fry was approximately 50 percent of the previous year's record. However, by virtue of new experimental methods the young lobsters were reared to larger size before releasing, as a means of producing greater survival. Over 5½ billion of the above-mentioned species were distributed as fertilized eggs on the spawning grounds. This is a byproduct recovery, since these eggs would otherwise be completely wasted in the marketing of the fish taken by the commercial fishermen. Propagation of mackerel was again resumed at the Woods Hole, Mass., station with an output of 11,000,000 fry. An outstanding development was the establishment by the Maine Department of Sea and Shore Fisheries of a large modern lobster-rearing unit on the grounds of the Federal hatchery at Boothbay Harbor, Maine. This establishment is operated by the State on a cooperative basis with the Bureau. There is assurance that this project will be of great significance in the future in conserving and building up the supply of lobsters, the mainstay of the inshore fisheries of the State.

*Pacific salmon.*—There was a worthwhile increase in the production of chinook salmon. This species is handled in two fields, the Columbia River and the Sacramento River, and the distribution was materially increased in both areas. This is especially gratifying in view of the fact that both runs have been threatened by the construction of large dams, and the 1939 figures for hatchery production indicate that there will be a satisfactory stock of salmon upon which to base future propagation activities which will serve to nullify the detrimental influences of dams. Absence of humped-back salmon in the records is merely a result of the so-called "off year" for this species. Sockeye salmon are handled in the Puget Sound area and at Quinault, Wash. At the latter point the production is deliberately curtailed so as to permit the rearing of all of the fry produced to a larger size before distribution. The salmon hatcheries also included the propagation of steelhead trout, a preeminent game fish, within the scope of their work but failed to obtain a production equal to that of the previous year.

*Anadromous species, Atlantic coast.*—The second year of an intensive program of rehabilitation of the shad has shown an increase in the hatchery production of this species. Over 34 million fry were planted, in comparison with 26 million in 1938. No new propagating stations were operated and the increase is a direct result of larger runs and more intensive hatchery utilization of the potential egg supply. The shad stations on the Potomac River and at Edenton, N. C., also proagated other indigenous species, including the white perch, yellow perch, and striped bass. These are handled somewhat as a side line since they are propagated during the inactive season for shad. The output of 1,797,000 striped bass fry in North Carolina represents a material increase and is in line with an effort to build up this valuable species.

*Commercial species, interior waters.*—Inasmuch as the supply of buffalofish and carp appears adequate for economic needs the hatchery production of these forms was curtailed and no carp whatever were distributed. Several of the States in the Great Lakes area are opposed to any promiscuous propagation or distribution of carp and the Bureau has coordinated its work accordingly. As a consequence the present contribution to the commercial fisheries of the interior section was the propagation of whitefish, lake herring, and lake trout carried on at Put-in-Bay, Ohio; Duluth, Minn.; and Cape Vincent, N. Y. Production of pike perch at Put-in-Bay was brought up to 334,000,000, a noticeable increase over 1938. The aggregate production of whitefish at the Bureau's stations amounted to approximately 33,000,000, somewhat lower than the previous year. Lake trout production at a level of slightly over 2,000,000 reflects the difficulty of securing eggs of this species. A new policy was adopted in connection with the propagation of the lake trout, however, by the reopening of the Bureau's hatchery at Charlevoix, Mich., for the purpose of rearing the fish to the fingerling size before release. Several hundred thousand lake-trout fry were supplied by the Michigan Conservation Department and were being fed at the Charlevoix hatchery at the close of the year. The activities at the Put-in-Bay, Ohio, station were conducted jointly with the State of Ohio, as has been the case for several years. It is felt that the State is in a position to take full responsibility for this work and at the close of the year negotiations were under way whereby the hatchery property might be turned over to the State.

*Game species.*—Again the collection of black-spotted trout eggs at Yellowstone Park was materially increased, the collection of eggs approaching 40,000,000. There was a moderate drop in the production of the other species of game trout, and a noticeable increase in the production of largemouth and smallmouth bass, the distribution amounting to over 14,000,000. Of this total, approximately 9,000,000 represented the fingerling and larger sizes which are so eagerly sought for restocking the tremendous area in which these two species thrive. The yield of the lesser warm-water species, including the sunfish, crappie, rock bass, warmouth bass, catfish, etc., was greatly below the levels maintained previously. However, as indicated elsewhere, this is of little significance as far as stocking is concerned because of the fact that the millions released in previous years were largely replanted directly in the Mississippi River in the area where they were salvaged. There was a continuation of the program for acquiring more distribution trucks, and the handling of fish applications was systemized and organized so as to coordinate the planting with the corresponding activities of the States. More and more of the game fish from Federal hatcheries are being utilized in stocking Federal lands, particularly in national forests, reclamation reserves, Indian reservations, and tracts which have been acquired in the land utilization program.

The Bureau again made an allotment of rainbow trout eggs to Puerto Rico in continuation of the program for developing trout fishing in that Territory.

### RESCUE OPERATIONS

The virtual completion of the 9-foot channel in the upper Mississippi River brought to a practical close the practice of salvaging fish in the overflowed areas and sloughs, which development has been predicted by the Bureau. There were handled in this activity only 2,800 fish of all species in comparison with the 40 to 50 million which were seined and returned to the river in the past. The Bureau, however, has proceeded with the construction of propagating ponds in the Refuge, particularly at Genoa, Wis., and Guttenberg, Iowa. The yield of game fish, especially bass, from these ponds has been most surprising and there is ample evidence of a continuing supply of bass and sunfish if the program of construction can be continued.

## FISHERY INDUSTRIES

### ECONOMIC AND MARKETING INVESTIGATIONS

*Surplus fish situation.*—The holdings of frozen, cured, and canned fishery products in the United States in the spring of 1939 amounted to about 172,000,000 pounds, according to a study of the surplus fish situation. This represents about 5,600,000 pounds more than normal holdings.

*Survey of retail marketing of fish and shellfish.*—The field work of a survey of retail marketing of fish in about 50 representative cities east of the Mississippi River was completed late in the fiscal year 1939. The results of the survey will be tabulated and analyzed to determine the factors which lead to the most favorable response from the public and to establish criteria which may guide retailers toward those practices which are most successful or promising.

*Commercial fisheries of the world.*—On the basis of the most recent available data, the world's annual commercial catch of fishery commodities amounts to about 33,600,000,000 pounds, valued at approximately $740,000,000. The United States, including Alaska, ranks first in the value of annual yield and is exceeded only by Japan in volume.

*Cod fisheries off the east coast of North America.*—In 1935, which is the most recent year for which complete statistics are available, the catch of cod off the east coast of North America by Canadian United States, French, and Portuguese fishermen, amounted to 1,109,000,000 pounds, as compared with an average annual catch of 1,108,000,000 pounds for the 10-year period from 1926 to 1935, inclusive, and 1,169,000,000 pounds for the preceding 10-year period. The most important country in the volume of its catch of cod in this area is Newfoundland, which took an annual average of 495,000,000 pounds during the period from 1931 to 1935. Following in order of the importance of their annual catches were Canada, France, the United States, and Portugal.

*Cooperative marketing.*—During 1938 work was continued on the collection of data relating to fishermen's cooperatives and other fishermen's organizations in this country and abroad. Appeals for aid in organization of cooperatives have been received from many sections of the country and such assistance has been rendered as has been possible with the limited staff and funds available for this work. Arrangements have been completed to enlist the aid of statistical and marketing agents of the Bureau, who visit virtually all the fishing areas of the United States each year, to assist in keeping the Bureau's data on fishermen's organizations current.

## STATISTICAL INVESTIGATIONS

### FISHERIES OF THE UNITED STATES, CALENDAR YEAR 1937

*New England States.*—The commercial fisheries of Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut in 1937 gave employment to 19,624 fishermen who took 670,864,000 pounds of fishery products, valued at $19,937,000. This is an increase of 2 percent in volume and 11 percent in value as compared with 1935 when the most recent previous survey of the total catch was made. Landings by United States fishing vessels at Boston and Gloucester, Mass., and Portland, Maine, in 1937, amounted to 387,960,000 pounds, valued at $9,790,000—a decrease of 6 percent in volume and 12 percent in value as compared with 1936.

*Middle Atlantic States.*—During 1937 the commercial fisheries of New York, New Jersey, Pennsylvania, and Delaware gave employment to 7,720 fishermen. Their catch amounted to 264,652,000 pounds, valued at $7,896,000—a decrease of 5 percent in volume but an increase of 23 percent in value as compared with the catch in 1935 when the preceding complete survey of the catch was made. A survey of the Hudson River shad fishery for 1937 showed that 613 fishermen took 2,732,000 pounds of shad, valued at $213,000—an increase of 11 percent in volume and 25 percent in value as compared with the catch in the previous year.

*Chesapeake Bay States.*—In 1937 the commercial fisheries of Maryland and Virginia employed 16,529 fishermen. Their catch amounted to 292,244,000 pounds, valued at $6,361,000—a decrease of 7 percent in volume and 2 percent in value as compared with the previous year.

*South Atlantic and Gulf States.*—The commercial fisheries of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas gave employment to 30,244 fishermen in 1937. Their catch amounted to 546,751,000 pounds, valued at $14,226,000—a decrease of 2 percent in volume but an increase of 5 percent in value as compared with the previous year.

*Pacific Coast States.*—During 1937 the commercial fisheries of Washington, Oregon, and California gave employment to 21,555 fishermen, whose catch amounted to 1,576,877,000 pounds, valued at $28,776,000. This is a decrease of 18 percent in the volume but an increase of 16 percent in the value of the catch as compared with the previous year. The total catch of halibut by United States and Canadian vessels in 1937 amounted to 48,659,000 pounds, valued at $3,828,000—an increase of 1 percent in volume and 6 percent in value as compared with the catch in the preceding year.

*Lake States.*—In 1937 the commercial fisheries of the United States and Canada, in the Great Lakes and international lakes of northern Minnesota (Lakes Ontario, Erie, Huron, Michigan, and Superior, Namakan and Rainy Lakes, and Lake of the Woods), yielded 116,064,000 pounds of fishery products. Of this amount, United States fishermen took 83,958,000 pounds, valued at $6,033,000—a decrease of 11 percent in volume and 6 percent in value as compared with the catch in the previous year. The Lakes fisheries of the United States gave employment to 6,418 fishermen in 1937.

*Mississippi River and tributaries.*—Complete data on the fisheries of the Mississippi River and its tributaries were not obtained for 1937. The catch of Lakes Pepin and Keokuk and the Mississippi River between the two lakes in 1937 amounted to 5,585,000 pounds, valued at $226,000—a decrease of 32 percent in volume and 40 percent in value as compared with the catch in these waters during 1936.

### MANUFACTURED PRODUCTS OF THE UNITED STATES AND ALASKA, CALENDAR YEAR 1937

*Fresh and frozen packaged fishery products.*—In 1937 the domestic production of fresh and frozen packaged fishery products amounted to 201,803,000 pounds, valued at $27,678,000. Important commodities in this group were fresh-shucked oysters, 6,644,000 gallons, valued at $9,081,000; packaged haddock, 30,187,000 pounds, valued at $4,162,000; and fresh-cooked crab meat, 8,300,000 pounds, valued at $2,822,000.

*Frozen products.*—The production of frozen fishery products in 1937 amounted to 168,224,000 pounds, estimated to be valued at $14,600,000. The volume of the production was 6 percent less than in 1936. The principal items frozen were groundfish, whiting, salmon, halibut, and rosefish.

*Cured products.*—The production of cured fishery products, based on surveys for 1937 in all sections except the Mississippi River, and for 1931 in that area, amounted to 104,339,000 pounds, valued at $15,636,000. Important products in this group were smoked and kippered salmon, 12,173,000 pounds, valued at $3,515,000; salted cod, 19,857,000 pounds, valued at $2,379,000; and mild-cured salmon, 9,615,000 pounds, valued at $1,863,000.

*Canned fishery products.*—In 1937 the production of canned fishery products amounted to 742,197,000 pounds, valued at $105,175,000—a decrease of 7 percent in volume but an increase of 11 percent in value, as compared with 1936. Canned salmon was the most important item, accounting for 362,642,000 pounds, valued at $52,924,000. Other leading canned fishery products were tuna and tunalike fishes, sardines, shrimp, mackerel, clam products, and oysters.

*Byproducts.*—The production of fishery byproducts in 1937 was valued at $36,804,000—an increase of 17 percent as compared with the previous year. The principal products in this group were marine-animal oils and meals and aquatic shell products.

### FISHERY MARKET NEWS SERVICE

The past year has been one of intensive activity in the development of the Fishery Market News Service and in the opening of new offices. Field offices for the daily collection and dissemination of fishery market news are now operating in New York, N. Y.; Boston, Mass.; Chicago, Ill.; Seattle, Wash.; and Jacksonville, Fla. In addition to these offices for the preparation and dissemination of daily reports, the service also operates numerous news-reporting activities in important fish-producing areas along our coasts. These reporting activities make possible the inclusion of a much wider coverage of news in the daily reports of our field offices than would otherwise be possible. Periodic market news reports also are prepared and disseminated from the Washington office. These include summarized data made available through the daily and monthly reports of the field offices as well as articles relating to the commercial fisheries and other related information.

## TECHNOLOGICAL INVESTIGATIONS

*Preservation of fishery products for food.*—During 1938 projects in this field included studies of rancidity in fish, of lactic acid as a possible index of decomposition in frozen fish, of identification of canned salmon, of changes in the composition of pink salmon, of the composition of commercial species of fish taken on the Pacific coast, and the canning of aquatic products.

Of particular interest has been the work on lactic acid as a possible index of decomposition in frozen fish. It is known that lactic acid rises to a maximum content in fish muscle during the rigor of death. It has also been shown that the alkaline reaction of fish muscle and the accompanying onset of spoilage of the fish follows after the loss of muscular rigor. Since spoilage occurs after the lactic acid content of the fish muscle reaches a maximum, the determination of lactic acid in fish flesh before and during a period of cold storage is of value in obtaining direct knowledge of the processes of decomposition of fish.

Information has been obtained regarding the changes in the chemical composition of pink salmon accompanying the pronounced physical change during their spawning migration and while in the commercial fishery. Additional data have been collected in connection with the development of a means for identifying the various species of salmon after canning. A survey has been undertaken to determine the chemical composition of the principal food fish of the Pacific coast, and the wastage occurring during their preparation for market. Studies were continued to determine the effectiveness of certain natural antioxidants in preventing rancidity in preserved fishery products and an attempt is being made to develop a simple and accurate method for measuring oxidative deterioration in fatty fish.

*Bacteriological studies.*—During the past year important bacteriological problems were studies of ultraviolet rays in killing bacteria, studies in the handling of fresh oysters, and studies of methods of preparing crab meat.

The studies in the handling of fresh oysters revealed that there is a definite relation between the pH in oysters and the bacterial count. The experiments showed that the bacterial flora changes with the acidity of the oysters and the bacterial count rises as a result of the increased acidity of the oysters. It was further discovered that excessive washing of oysters with fresh water caused a loss of mineral content.

At the request of several members of the crab-meat industry, the Bureau assigned a chemist and a bacteriologist to investigate possible measures designed to improve the quality of their product. This investigation included a survey of the crab-meat packing plants with a view to making recommendations as to improved methods of handling and packing for shipment which would assure the public a higher quality product. Tentative recommendations were made to the crab-meat packers pending the issuance of a completed report.

*Pharmacological studies.*—As indicated in previous years, the role of minerals in nutrition has become increasingly important. Fishery products are considered to be an excellent source of minerals in quantity and variety, and a better understanding of the physiological effects of these minerals on the animal organism is necessary. During 1938 the Bureau's technologists completed a study of the chemical and pharmacological aspects of fluorine in fishery products. No toxic symptoms were observed when the fluorine in the diet came from salmon or mackerel.

*Nutritive value of fishery products.*—During 1938 investigations in this field included a study of the chemical composition and nutritive value of fish proteins, the vitamin content of fishery products, a study of sodium alginate (produced from sea kelp) as a stabilizer in products of the dairy industry, and a cooperative study of kelp meal in animal feeding at the dairy department of the University of Maryland and of the Maryland State Agricultural Experiment Station, College Park, Md.

The studies of the mineral constituents of fishery products showed that fish fillets are about equal to the muscle cuts of beef in mineral content, except that the fish greatly exceeds the meat in iodine content; that canned salmon contains about 15 times as much calcium, almost twice as much phosphorus, 20 times as much iodine, and approximately equal quantities of other minerals as beef round; and that oysters, shrimp, and crab meat contain approximately half as much calcium, more than 5 times as much magnesium, and more phosphorus than an equal quantity of milk. In addition, these shellfish are a particularly good source of iron, copper, and iodine.

The results of the studies on the chemical composition and nutritive value of fish proteins showed that, by using an arbitrary factor of 100, the proteins of the following fish and shellfish fell into the following groups according to relative growth-promoting value, as compared to beef at a factor of 63: Oysters, 100; pilchard, red snapper, shrimp, and Boston mackerel, 90; and shad, cod, croaker, and silver salmon, 80.

The results of the studies on sodium alginate showed that this product is an excellent mechanical stabilizer for use in food products, due to its chemical and physical properties and high viscosity value.

*Preservation of fishery byproducts.*—During the year data have been obtained regarding specific problems of salmon cannery waste utilization. These include investigation of the suitability of small-unit operations for canneries whose outputs are too small to warrant installation of standard fish-meal equipment, the preparation of edible salmon oils, the preparation of dehydrated protein and vitamin concentrates, and in the case of large canneries having short operating seasons, the chemical preservation of waste for subsequent reduction and the conversion of waste into new types of products as a result of chemical treatment. A survey was undertaken to determine the potential vitamin value of the livers and viscera of the principal food fish taken commercially on the Pacific coast. In cooperation with the Division of Fish Culture and the University of Washington

School of Fisheries, information was obtained which helps to clarify the steps in preparation responsible for improving the nutritional properties of fish meal for fish feeding and which suggest less costly processes of manufacture. Also, studies were made which indicate the possibility of materially reducing the danger of spontaneous heating of fish meal, a difficulty which now causes the industry great inconvenience and considerable financial loss.

## BIOLOGICAL FISHERY INVESTIGATIONS

### INVESTIGATIONS OF COMMERCIAL FISHES

*North Atlantic fishery investigations.*—In the offshore fisheries of New England, analysis of extensive data collected during the course of the haddock investigation has thrown considerable light on the changes in the abundance of this species and has suggested a plan for the stabilization of yield. Years of poor survival are either years in which large haddock are especially abundant, offering serious competition for food, or years when the stock of adults has been so reduced as to furnish insufficient spawners. The most favorable level was approximately that which prevailed in 1922 to 1924, 1929, and 1936. The course of the natural cycles of abundance may be seriously interfered with if a period of intensive fishing happens to coincide with a period of poor survival of the young. The recent marked decline in the abundance of haddock, which has been evident both on Georges and the Nova Scotian Banks has been shown to be the result of such a combination of circumstances. It is indicated, therefore, that by holding the population at the optimum level by regulation of the fishing intensity, it would be possible to sustain the yield at a productive level.

Data collected during the year on the age composition of the catch revealed an increasing dependence on the young or "scrod" haddock, a trend which is regarded as prejudicial to the interests of the fishery, inasmuch as these fish are growing rapidly and would be of considerably greater value if allowed at least 1 more year's growth.

The catch records and biological data collected during the 1937 mackerel season, a year of extremely low production, were subjected to analysis during the year. The composition of the mackerel population differed markedly from previous years in that no year class or classes dominated the fishery. With the exception of the 1932 class, year classes following 1929 were present in better than 5 percent strength each. Inasmuch as a study of lightship temperature records revealed that water temperatures in the western part of the Gulf of Maine ran higher than the average for the previous 10 years, it is suspected that hydrographic conditions affected the distribution of mackerel and were an important factor in the low catch.

The catch for the 1938 season was almost double that of 1937, but the early season landings for 1939 sank to a lower level than those for the corresponding period of 1937. Biological data show that the mackerel spawned in 1937, a group that was expected to contribute much to the fishery, as 2-year-old fish were virtually unrepresented in 1939. Because pound-net fishermen inshore were reported to be making good catches, an investigation of the relation between the catch by seiners offshore and that of the pound nets was begun early in the 1939 season to determine to what extent changes in the offshore catch may represent merely changes in the distribution of mackerel.

During the fiscal year 1938 a study was undertaken to determine whether a decline in abundance of flounders is in progress in the North Atlantic area. In order to interpret fluctuations in abundance, it was necessary to develop techniques for determining age and growth, the existence of separate races within the population, and the extent of migrations.

Owing to the increased utilization of redfish, flounders, and other species of groundfish in addition to haddock, an investigation of the abundance of such fishes was begun during 1938. The central problem is to assess total catch, fishing effort, and abundance in order to determine for each species whether it has already reached the point where an increase in yield will give a larger production only with detriment to future supplies.

As a result of cooperation between the Bureau of Fisheries and the State of Maine, an investigation to test new methods of rearing lobsters, to determine the relative effectiveness of artificial and natural propagation, and to ascertain the condition of the lobster fishery on the coast of Maine has been added to other scientific fishery investigations being conducted in the New England area. The State has constructed a lobster-rearing plant adjacent to the Bureau hatchery at Boothbay Harbor, with facilities for carrying on experimental work, and has assigned funds for the employment of a biologist. Experiments with larval lobsters and tagging of adults were begun during the spring of 1939.

*Middle and South Atlantic fishery investigations.*—At the request of the New York State Conservation Department, the Bureau participated in a biological survey of the marine fisheries of Long Island, acting principally in an advisory capacity. The survey was undertaken to provide a basis for improving or maintaining good fishing wherever the supply is controllable and to determine by a census of fishing activities the recreational and commercial value of the marine district of Long Island. Definite recommendations for the conservation of several species and for additional study have been included in a report to be published by the State.

Evidence continued to accumulate which indicated an inadequate spawning escapement as the principal cause of the decline in abundance of shad along the Atlantic coast. Much of the field work of this investigation has been directed toward comparison of the spawning escapement in the Hudson, where complete recovery of abundance has occurred, with the escapement in other rivers which are still severely depleted. The principal methods of study are tagging experiments, designed to estimate fishing intensity from the percentage of tags recovered, and studies of scales intended to estimate the percentage escapement from the percentage of scales bearing spawning marks.

Prior to recommending measures to insure an adequate number of spawners in the various coastal rivers, it was necessary to determine whether shad return to spawn in their native rivers or whether, as many fishermen believe, there are extensive migrations. A direct attack on this problem has been made by tagging. Results of tagging experiments in North Carolina, the Chesapeake Bay, and the

Hudson indicate that the great majority of shad return to the same river year after year. Additional data on this point are being gathered by extensive analysis of the racial characteristics of shad from the different rivers.

Because of the importance of reproduction in shad conservation a careful ecological study of the early life history is being made in southern rivers. In 1938 intensive work was done in the Edisto and in 1939 these studies were extended to other rivers.

*Shrimp investigations.*—Studies of the shrimp fishery consisted of several cruises to assess available supplies in the offshore waters of the Gulf of Mexico, a continuation of tagging experiments to determine the seasonal migrations of shrimp along both the Atlantic and Gulf coasts, and ecological studies of the relationship between environmental changes and the distribution of shrimp along the Texas coast.

As a result of a cruise of the *Pelican* along the Louisiana and Texas coasts in January and February, the presence of shrimp off the Louisiana coast in concentrations sufficient to warrant commercial exploitation was confirmed. No large concentrations of commercial shrimp were found off the Texas coast. In a later cruise a similar lack of commercial shrimp was observed off the coasts of Alabama and Florida between Mobile Bay and Apalachee Bay.

Tagging of shrimp on the Atlantic coast from Cape Canaveral to St. Augustine, where the bulk of the South Atlantic coastal shrimp congregate for the winter, gave evidence of a return movement at least as far as 250 miles northward. Other tagging experiments indicated that the small shrimp do not engage in coastwise migrations as extensively as do the larger sizes.

In cooperation with the Texas Game, Fish, and Oyster Commission, a program of hydrographic surveys and experimental trawling was instituted in Aransas Bay to determine the extent to which hydrographic factors may control the distribution of shrimp and day-to-day fluctuations in the catch.

*North Pacific and Alaska fishery investigations.*—Commercial fishery investigations in northern Pacific waters form the basis of recommendations for the management and conservation of the salmon runs in the rivers of the Northwestern Coastal States. They are also concerned with maintaining at a productive level the salmon and herring fisheries of Alaska, over which the Federal Government has regulatory power.

The activities of the Columbia River staff have centered about the problem created by the erection of Grand Coulee Dam, blocking that portion of the Columbia River salmon run that normally spawns in tributaries of the upper Columbia. Salvage operations were begun in 1939. The runs are being trapped at Rock Island Dam, 150 miles downstream, and transferred in specially constructed trucks to tributaries between Rock Island and Grand Coulee Dams. It is hoped that the fish will spawn in these tributaries, and that their progeny will later return to them. If the plan yields the anticipated results, the entire run of upper Columbia fish will be transferred to tributaries below Grand Coulee within a period of 5 years, or the life cycle of a salmon.

At the beginning of the fiscal year 1939 Congress made funds available to the Bureau of Fisheries for a large-scale study of the factors that control the salmon populations of Bristol Bay in order that a sound and comprehensive system of management might be applied. With the cooperation of the Coast Guard, extensive hydrographic observations were conducted in the summers of 1938 and 1939. Biological observations were made also to discover the schooling habits of the fish far offshore, the abundance and distribution of food animals, and the migratory habits of the salmon in approaching the coast from these offshore feeding grounds. Correlated with these oceanographic studies, investigations of the life cycle of the salmon in the five major watersheds of this area are under way. These include detailed population studies of the spawning runs, surveys of spawning grounds, and measurement of the mortality of the young in fresh water. This investigation is planned to cover a 5-year period, or the normal life cycle of the red salmon.

Studies of the returns to be expected from any given escapements of spawning salmon were continued in the Karluk watershed. Further evidence was secured that variations in the ratio of returns to escapement are mainly due to conditions existing in the fresh-water environment. To determine the role of the predatory Dolly Varden trout in reducing the number of young red salmon, the migratory habits and biological characteristics of the populations of trout have been investigated through the tagging of large numbers of these fish.

In areas where the migration routes of salmon pass through commercial fishing areas to a number of different streams, the 50-percent escapement required by law cannot be assured unless the exact routes of the salmon and their distribution on the spawning grounds are determined. Tagging experiments were conducted during the 1938 and 1939 seasons to trace the migration routes of pink salmon passing through Lower Chatham Strait. The two experiments will provide information covering the routes of migration of both the odd- and even-year pink salmon runs.

The usual population studies to determine the size of the pink-salmon runs and the proportion of males and females were conducted at Little Port Walter. The construction of a permanent dam and counting weir, which was in operation during the 1939 season, now permits an accurate count of seaward-migrating young as well as upstream migrants, so that the returns from a known number of spawners may be determined with greater accuracy than heretofore. Changes in the time of appearance of the pink salmon runs are being closely analyzed so that any necessary curtailment of the fishery may be effected in time to allow an adequate escapement to the spawning grounds.

As an aid to rebuilding the runs of coho salmon in Puget Sound, studies have been carried on over a period of years to determine the age at which hatchery-reared fry may be released most advantageously. A series of marking experiments for this purpose was concluded in 1938. Biological studies of the size and age composition of the population were made by taking samples of the commercial catch and of the fish on the spawning grounds.

Studies of the age composition of the herring population of southeastern Alaska were responsible for demonstrating that this stock has declined to a dangerously low level and that curtailment of fishing is necessary. The decline has been caused by the virtual failure of three successive broods, those of 1932, 1933, and 1934, combined with excessive fishing. Closure of the Cape Ommaney area was recommended until the population shows definite signs of recovery. The fishery of the Prince William Sound and Kodiak areas continued at a high level of abundance, but since considerable expansion is contemplated, a close watch must be maintained to avoid overexploitation.

Collection, tabulation, and analysis of the daily catch records from the various types of fishing gear operated by the salmon fishing industry in Alaska have been continued. Indexes of abundance derived from these data are an important basis of recommendations for changes in the fishing regulations.

*Pilchard investigations.*—Although biologists of the Pacific Coast States have already collected a considerable body of information bearing on the migrations, spawning, and age and growth of the pilchard, the basic problem remaining for solution is the determination of the optimum level of catch below which the stock would go to waste through underutilization, above which it would become reduced to commercial unimportance through overexploitation. To provide a basis for determining this level, the staff conducted studies dealing with the determination of abundance, age, and reproductive success, and with the importance of intermigration.

The use of aerial observers in gaging abundance was tested but rejected as unsatisfactory. Changes in relative abundance are therefore being determined by statistical analysis of the commercial catch records over a period of years.

To discover how much the stock is reduced by fishing it is necessary to determine the ages of the fish making up the population each year, thus learning the relative abundance of the individual broods of previous years and how fast they are removed by fishing and by natural mortality. Age determination is being attempted by interpreting marks in scales and otoliths, by observing the growth of young pilchards, and by identifying modes in frequency distributions of the adult population.

During the spring of 1939 several cruises were made in the spawning and nursery grounds, quantitative samples of the young pilchards being taken. These cruises were made possible by the cooperation of the Scripps Institution of Oceanography, which furnished the vessel *E. W. Scripps*. When the surveys are completed, it is hoped that light may be thrown on the distribution and abundance of eggs and young, as well as on the effect of oceanic conditions on the success of spawning.

To determine whether the pilchard stock in northern waters is self-perpetuating or is maintained by migrations from other areas, techniques are being developed for appraising the contributions from various spawning areas through study of the sculpturing on the scales. If the method proves valid, it will aid in determining how much fishing in specific areas affects the stock in other areas.

*Great Lakes fishery investigations.*—A state of critical depletion continues to exist among the more valuable commercial species of the Great Lakes. The extent of this depletion is apparent from comparisons of present-day production of certain species with yields of earlier years. In Lake Michigan, for example, production of wall-eyed pike, lake herring, lake trout, whitefish, and yellow perch varies from 43 to 62 percent of normal. Production of Lake Superior whitefish is only 10 percent of normal. In Lake Huron production of perch and chubs is 44 and 36 percent, respectively, of normal. In Lake Erie production of nearly all important commercial species is on the decline, and total production of Lake Ontario is only 10 percent of normal.

Members of the Great Lakes staff cooperated actively with State and Federal officials and with sport and commercial fishermen, participating in an advisory capacity in 19 meetings and conferences in which Great Lakes fisheries problems were under consideration and assisting State conservation officials in the drafting of fisheries regulations.

At the request of the Office of Indian Affairs of the Department of the Interior, a survey was made of the fisheries of Upper and Lower Red Lakes in Minnesota to settle various controversies concerning the regulation of the commercial gill-net fishery. Recommendations for the management of the fishery are being submitted.

The report of the International Fact-Finding Commission on Lake Champlain was largely completed. The report will contain a discussion of the fisheries controversies, a tabulation and analysis of all available information concerning commercial fishing and angling, descriptions of the natural history of the various species, a critical historical review of the artificial propagation of wall-eyed pike and yellow perch, and recommendations for the regulation of the commercial and sport fisheries of the lake.

Age and growth studies of the whitefish of Lake Huron and Lake Champlain were completed for publication, and life-history studies of the yellow perch were continued.

## AQUICULTURAL INVESTIGATIONS

The work of the aquicultural investigations continued along three principal lines: The development of means to obtain the maximum production of food and game fishes consistent with environmental conditions, the improvement of methods of artificially propagating and rearing fish, and the control of fish parasites and diseases.

Investigations were conducted in trout waters to obtain definite information on the annual drain to which the trout population is subjected by anglers and the value of artificial stocking in maintaining a stable fish population. Such studies were conducted through the operation of test waters in Vermont; experimental stocking of streams in the Pisgah National Forest where fishing is closely supervised and an accurate check on returns may be obtained; and the operation of the Convict Creek experimental stream in California. These studies have demonstrated that in some situations natural propagation is superior to artificial in maintaining a stock of trout under adverse conditions and have emphasized the necessity of regulating planting operations in accordance with the amount of natural food present in the streams.

Feeding experiments with fingerling, yearling, and adult trout were carried out at the Leetown, W. Va., and Pittsford, Vt., stations to determine the effect on growth, mortality, and egg production of dry meals fed at different levels and in different combinations. One of the most striking results was the marked increase in growth following the addition of cod liver oil to a diet composed of sheep liver and whitefish meal. Experiments with brood fish showed considerable variation in the hatchability of eggs from fish on different diets.

During the year a regional biologist was appointed to resume fish management work in the Intermountain Region. In this area fishing intensity is increasing rapidly and many of the streams are unable to maintain a sufficient fish population to meet demands. In addition to overfishing, adverse changes in the streams and lakes are important factors in the general decline. Among such changes might be cited silting resulting from overgrazing, hydroelectric and irrigation projects that interfere with normal migrations, and fluctuations of water level in artificial lakes. Management plans have been worked out for several waters showing possibilities of early improvement of fishery resources.

The staff of the California trout investigations has been engaged in determining the number of salmon and the extent of spawning streams that will be blocked by the completion of the Shasta Dam on the Sacramento River. The estimates of the 1938 fall run combined with the counts of the 1939 spring run fish indicate that approximately 25,000 salmon a year will ultimately have to be handled in the salvage operations. Pending the completion of engineering surveys to determine the feasibility of certain alternative features of the plan, a tentative program has been drafted which calls for a combination of artificial propagation and provision of areas for natural spawning below the dam.

Field work in bass streams was designed to measure the extent and efficiency of natural propagation and the effect of intensive fishing on the bass population. An important result of these studies was the finding that even in heavily fished waters there is little danger of serious depletion of bass if adequate spawning facilities are available. However, intensive fishing frequently leaves excessive numbers of small bass, with consequent reduction in the abundance of forage fishes. It is apparent that the remedy is to build up the food supply and that stocking with young will only serve to intensify the unbalanced condition. Programs for the effective management of bass in ponds and lakes are being developed in Florida.

Facilities for the experimental study of fish diseases were greatly increased during the year with the enlargement of the field laboratory at the Quilcene, Wash., hatchery, and the provision of a second experimental laboratory through the cooperation of the University of Washington. Studies of various disinfectants used in the prevention and treatment of disease were continued to determine the maximum nontoxic concentrations that the fish could withstand. Studies of common bass parasites, believed to be an important factor in the mortality of the young, were carried on at Leetown, W. Va. The Disease Service continued to aid Federal, State, and private fishculturists in the diagnosis of hatchery disease.

### POLLUTION INVESTIGATIONS

Field and laboratory studies have been continued over a wide area of the country for the purpose of analyzing stream and hatchery waters from the standpoint of their suitability for various types of fishes and of determining the harmful actions of specific pollutants. Methods of determining the physiological condition of the fish themselves have been markedly improved.

Many of the findings of the past year are of considerable interest and importance. For example, it has been found that arsenicals and other materials commonly used as mosquito larvacides impair the growth and nutrition of fishes even though used in very small quantities, and may also build up serious hazards of lethal poisoning. It has also been demonstrated that small quantities of many substances, normally present or introduced into streams and lakes, may have a cumulative effect over a period of time that is even more detrimental to fish life than many more obvious pollutants. Certain minerals found in small quantities in various western streams and several inorganic salts that are common in southern and western waters exert this type of cumulative action.

Problems arising from the concentration of minerals and other compounds hazardous to fish and other aquatic life in impounded waters have been investigated at Elephant Butte Reservoir, N. Mex., and Lake Mead, Nev.

Acute pollution problems were investigated during the year in Florida, South Carolina, North Carolina, Minnesota, Idaho, Montana, Oregon, and Mississippi. Specific types of industrial pollution studied include that produced by paper mills, phosphate mines, and copper, lead, zinc, and placer gold mining operations.

### CONSTRUCTION OF FISH-PROTECTIVE WORKS

A section on hydraulics has now been established under the supervision of the Division of Scientific Inquiry, with an experienced engineer for the design of fish-protection facilities. During the year the engineer assisted in designing and supervising the installation of fish screens being constructed with the aid of P. W. A. and W. P. A. funds on certain Federal power and irrigation projects in the Northwest. Important consulting services on screens and ladders were also afforded to other agencies.

### SHELLFISH INVESTIGATIONS

Scientific investigations have been directed toward increasing the cultivation of oysters, improving the quality of oyster meat, and standardizing the raw and canned product.

In the Long Island Sound area, where the collection of a good crop of seed oysters is of paramount importance to the industry, regular bulletins were issued during both the 1938 and 1939 seasons advising oystermen when spawning and setting might be expected. To aid in protecting valuable beds from starfish, surveys of the distribution of this oyster enemy were made and the results communicated to oystermen, permitting more efficient eradication.

On the south Atlantic coast, although generally favorable conditions for growth are found, some beds are badly overcrowded. Experiments are being conducted to develop a method of protecting seed oysters from the attachment of larval oysters, barnacles, etc., so that they may be grown to marketable size as single individuals of good quality.

Experimental oyster beds have also been established in South Carolina to develop methods of cultivation suitable for small oyster farms, from 2 to 10 acres in extent, to be leased and operated by the tidewater residents. The program differs from previous experiments in presupposing that capital requirements will be at a minimum and that materials, equipment, and supplies will be obtained or produced by the labor of the oyster farmer himself.

At the Pensacola, Fla., laboratory an experimental oyster farm is being established to determine rates of growth and fattening, productivity annually per unit of bottom, and costs of production. The results will be compared with those of similar projects conducted on the Atlantic coast. A program of oyster planting and of rehabilitation of exhausted natural beds is also being conducted from this laboratory.

Investigations carried out at the Yorktown laboratory demonstrated that pollution of the river by pulp-mill wastes has brought the decline of the oyster fisheries. During the past year intensive chemical studies were carried on for the purpose of determining the particular chemical or chemicals in the pulp-mill effluents which are responsible for the altered physiology of oysters. An attempt will then be made to find a means of eliminating the harmful substances.

Studies of the physiology of the oyster carried out at Woods Hole, Mass., included investigations of the phenomenon of sex reversal in adult oysters, experiments on the time of survival of eggs and sperm, and a study of respiration in relation to the carbohydrate metabolism of the oyster and the accumulation of elements which are important food constituents of oyster meat.

## LAW ENFORCEMENT DIVISION

The act of July 2, 1931, the Federal Black Bass Law regulating interstate commerce in black bass, is administered by this Division; also certain parts of the Whaling Treaty Act of May 1, 1936, giving effect to the various international treaties for the protection of whales. The Division also maintains an angler's service, and issues permits to take bait fish in the District of Columbia.

*The Federal black bass law.*—The personnel and methods of enforcement remain the same as last year. Owing to insufficient personnel, no particular effort has been made to carry on the work west of the Rocky Mountains, where salmon and trout predominate. Reports of illegal interstate shipments of black bass have been investigated, producing evidence of violations of both State and Federal laws. A number of these cases have been turned over to the States for prosecution in State courts, as such action generally produces quick and effective results. Two cases of illegal interstate shipments of black bass by trucks were successfully prosecuted during the year, a fine of $100 and 1 day in the custody of the U. S. Marshal being assessed in each case. The defendant in one of these cases remained in jail approximately 3 months previous to trial, being unable to furnish the required bond.

Improvements in State laws protecting black bass have been continued in accordance with the Bureau's recommendations for adequate protection. Thirty-nine States now prohibit the sale of black bass at all times, regardless of where taken, and all but four States provide a closed season on these game fish during at least a part of the spawning period. The States have cooperated 100 percent in carrying on this branch of the work. A summary of the game-fish laws for 1937–38, with special reference to black bass, was prepared and published, also several leaflets on subjects pertaining to angling.

*Whaling.*—The total number of licenses issued for taking whales was 15—covering 3 shore stations and 12 catcher or killer boats. The total revenue received for these licenses was $4,750 which was covered into the United States Treasury.

The Division prepared, in accordance with the terms of the Whaling Convention of September 24, 1931, two statistical reports covering the number of whales captured, species, size, etc., and has made biological studies of the samples of stomach contents taken from whales captured by United States vessels. It has completed two biological reports which, together with the two statistical reports, were forwarded to the International Bureau of Whaling Statistics, Sandefjord, Norway, as required under the convention.

*Angling.*—Requests for information on how, when, and where to fish with rod and line have increased during the fiscal year. Thirty-nine permits, required by act of Congress, to take certain small bait fish in the District of Columbia were issued.

## VESSELS

Fifteen vessels of the Alaska service cruised approximately 107,000 nautical miles in the fiscal year 1939, as compared with 117,000 miles in the previous year. The *Penguin* covered about 30,000 miles, the *Teal* 11,000 miles, and the *Crane* 9,000 miles. Owing to the accidental grounding of the *Brant* on Williams Reef on July 15, that vessel was out of commission during a considerable part of the season, and its total mileage in the fiscal year was only about 8,000 miles.

The *Penguin* made five round trips between Seattle and the Pribilof Islands, carrying personnel and emergency supplies. Interisland service also was performed, and native workmen from the Alaska Peninsula were transported to the Pribilofs to assist with sealing activities. Two trips were made to the western Aleutians in connection with sea-otter investigations and patrol.

The *Auklet*, *Kittiwake*, *Merganser*, *Murre*, and *Widgeon* were engaged in fishery protective work in southeast Alaska. The *Eider* operated in the Kodiak area, the *Ibis* at Chignik, the *Red Wing* in the Alaska Peninsula area, and the *Coot* on the Yukon River. The *Blue Wing* was on Prince William Sound and also assisted in the patrol of southeast Alaska.

The *Teal* operated on Cook Inlet, carried on the stream survey in the Prince William Sound area, and assisted in the stream survey and general patrol in southeast Alaska. The *Crane* transported personnel and supplies between Seattle and Bristol Bay and patrolled the Alaska Peninsula area. The *Scoter* was used on Bristol Bay and relieved the *Crane* in the Alaska Peninsula area for about 10 days.

The *Brant* was used in general supervisory work, chiefly in southeast Alaska, although a trip was made westward as far as Anchorage. In December this vessel transported employees of the Bureau between Seattle and points in southeast Alaska for the conduct of hearings on the Alaska fishery regulations. The *Brant* was based at Juneau for approximately 3 months at the beginning of the year to render service in connection with the biennial session of the Territorial Legislature.

The *Scoter* engaged in the fur-seal patrol in the vicinity of Neah Bay, Wash., in the spring of 1939.

The *Pelican* was engaged in exploratory trawling to determine the abundance and distribution of shrimp in the offshore waters of the Gulf of Mexico.

## APPROPRIATIONS

Appropriations for the Bureau for the fiscal year aggregated $2,220,200, as follows:

| | |
|---|---|
| Salaries, Bureau of Fisheries | $150, 000 |
| Propagation of food fishes | 962, 000 |
| Construction of fish screens | 20, 000 |
| Maintenance of vessels | 173, 000 |
| Inquiry respecting food fishes | 338, 000 |
| Fishery industries | 83, 600 |
| Fishery market news service | 70, 000 |
| Alaska fisheries service | 270, 000 |
| Enforcement of Black Bass and Whaling Treaty Acts | 17, 000 |
| Mississippi Wild Life and Fish Refuge | 17, 900 |
| Fish cultural station | 6, 500 |
| Travel expense | 112, 200 |
| | $2, 220, 200 |

U. S. GOVERNMENT PRINTING OFFICE: 1940

U. S. DEPARTMENT OF COMMERCE
BUREAU OF FISHERIES

# PROGRESS IN BIOLOGICAL INQUIRIES
## 1938

By ELMER HIGGINS

ADMINISTRATIVE REPORT No. 35

U. S. DEPARTMENT OF COMMERCE
HARRY L. HOPKINS, Secretary
BUREAU OF FISHERIES
CHARLES E. JACKSON, Acting Commissioner

Administrative Report No. 35

# PROGRESS IN BIOLOGICAL INQUIRIES
# 1938

By ELMER HIGGINS

APPENDIX I TO REPORT OF COMMISSIONER OF FISHERIES
FOR THE FISCAL YEAR 1939

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1939

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## ADMINISTRATIVE REPORT SERIES

Since the advent of the Administrative Report Series, considerable confusion has arisen concerning its system of numbering the separates composing it. Inasmuch as the Reports of the Divisions vary in order from year to year, many have found their designations as "Appendix No. I, II, III, or IV" very confusing. To relieve this, it has been decided to number them as "Administrative Report No. —." Inasmuch as 20 separates had already been printed in this series before starting the numbers, it was deemed advisable to begin the numbering with Administrative Report No. 21. Of course, numbers cannot be printed on those already off the press, but for the information of those who wish to know what the first 20 were, they are numbered for filing purposes as follows:

No. 1. Report, Commissioner of Fisheries, 1931.
No. 2. Alaska Fishery and Fur-Seal Industries, 1930.
No. 3. Fishery Industries of the United States, 1930.
No. 4. Progress in Biological Inquiries, 1930.
No. 5. Propagation and Distribution of Food Fishes, 1931.
No. 6. Report, Commissioner of Fisheries, 1932.
No. 7. Alaska Fishery and Fur-Seal Industries, 1931.
No. 8. Fishery Industries of the United States, 1931.
No. 9. Progress in Biological Inquiries, 1931.
No. 10. Propagation and Distribution of Food Fishes, 1932.
No. 11. Alaska Fishery and Fur-Seal Industries, 1932.
No. 12. Progress in Biological Inquiries, 1932.
No. 13. Fishery Industries of the United States, 1932.
No. 14. Propagation and Distribution of Food Fishes, 1933.
No. 15. Fishery Industries of the United States, 1933.
No. 16. Alaska Fishery and Fur-Seal Industries, 1933.
No. 17. Progress in Biological Inquiries, 1933.
No. 18. Propagation and Distribution of Food Fishes, 1934.
No. 19. Alaska Fishery and Fur-Seal Industries, 1934.
No. 20. Fishery Industries of the United States, 1934.

Note that the last Commissioner's Report was for 1932. Since then its place has been taken by a reprint from the Report of the Secretary of Commerce under the title "Bureau of Fisheries." Inasmuch as it is no longer a Bureau publication, it is not numbered; but it will be supplied to any who request the Report of the Commissioner for any year since 1932.

# PROGRESS IN BIOLOGICAL INQUIRIES, 1938[1]

By ELMER HIGGINS, *Chief, Division of Scientific Inquiry*

[With the collaboration of investigators]

## CONTENTS

| | Page |
|---|---|
| Introduction | 1 |
| Cooperation | 3 |
| North American Council on Fishery Investigations | 4 |
| Council of State Governments | 4 |
| Publications | 5 |
| North Atlantic fishery investigations | 8 |
| Haddock | 9 |
| Mackerel | 13 |
| Flounder | 15 |
| Analysis of groundfish abundance | 18 |
| Middle and South Atlantic fishery investigations | 23 |
| Shore fishes | 23 |
| Anadromous fishes | 25 |
| Shrimp investigations | 27 |
| Offshore operations | 28 |
| Tagging experiments | 29 |
| Ecological studies | 31 |
| North Pacific and Alaska fishery investigations | 32 |
| Columbia River salmon fisheries | 32 |
| Coho salmon | 34 |
| Bristol Bay salmon fisheries | 36 |
| Karluk River red salmon | 37 |
| Pink salmon | 39 |
| Alaska salmon statistics | 41 |
| Herring | 42 |
| Pacific pilchard investigations | 43 |
| Studies of abundance | 44 |
| Age and growth | 45 |
| Early life history | 46 |
| Origin of the commercial supply | 46 |
| Great Lakes fishery investigations | 47 |
| Studies of abundance | 49 |
| Age and growth studies | 49 |
| Special surveys | 50 |
| Shellfish investigations | 51 |
| Physiology of the oyster | 52 |
| Oyster cultural studies | 53 |
| Special surveys | 61 |
| Aquicultural investigations | 62 |
| Trout | 63 |
| Bass | 69 |
| Parasites and diseases of fish | 71 |
| Investigations in interior waters | 73 |
| Pollution studies | 73 |
| Ichthyological investigations | 76 |
| Independent activities of the fisheries biological laboratories | 77 |
| Woods Hole, Mass | 77 |
| Beaufort, N. C | 78 |
| Appropriations | 80 |

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[1] Administrative Report No. 35, Appendix I to Report of the U. S. Commissioner of Fisheries for 1939. Approved for publication June 1, 1939.

## INTRODUCTION

The fundamental objectives and general characteristics of the research activities of the Division of Scientific Inquiry have been presented at considerable length in the previous annual reports of "Progress in Biological Inquiries" together with detailed reports of the individual research projects. The underlying philosophy of fishery conservation based on a continually growing body of scientific knowledge is now so well understood and the program of investigation under way during the past decade has justified itself so completely, both in its theoretical aspects and its practical applications, that it has acquired a momentum that in itself is a protection against irresponsible diversion of interest or activity into byways of local application or temporary value. A lengthy introduction to the major purposes of the various investigations reported in detail herein is therefore unnecessary.

Each of the recent years has seen the development of new projects of investigation that contribute to a well-rounded scientific program designed to afford still more complete answers to the original questions as to "what diminution in the fish supply of our coastal and inland waters has occurred, to what causes the same may be due, and what remedial measures may be adopted?" With the passing of the years new techniques of investigation have been developed or have been adapted from other fields of scientific endeavor. New concepts of the reactions of marine fish populations to commercial fishing have developed and new knowledge of the natural requirements of fish in inland waters and of means of their management for sustained yield has accumulated.

Time has also permitted the ripening and the fruition of a series of fishery investigations, always time-consuming, so that during the year a number of definitive reports have been completed which, it is hoped, will be published in the near future. At the same time, and coincident with economic recovery, additional appropriations during the past few years have permitted the undertaking of new projects, bringing to hitherto neglected fisheries the benefit of research and the examination of their abuses or deficiencies and paving the way for their ultimate rehabilitation and protection.

During 1938 a new project of considerable magnitude was undertaken by the Division—an investigation of the red-salmon fisheries of Bristol Bay, Alaska. One of the richest and most productive red-salmon fishing areas in the world, Bristol Bay, an arm of Bering Sea in western Alaska, receives endless replenishment from the spawning grounds of five major tributary river systems. The fishery there has developed over many years until it reached a reasonably stable maximum at the beginning of the past decade. Three years ago, however, the fishery was menaced by an exploration seeking to establish commercial fisheries on the high seas to intercept the run of spawning fish en route to their native streams. The development of a commercial fishery in the offshore waters of Bristol Bay could only result in the disruption of the industry ashore, which takes its supply from coastal waters under strict regulation of the Federal Government, for adequate escapement of fish to the spawning grounds must be assured if the resource is to be maintained. The threat of developing an offshore fishery, therefore, was the occasion, if not the primary cause, of the undertaking of a comprehensive investigation of the Bristol Bay salmon, for the fundamental objective in such a study is to acquire sufficient knowledge of the natural history and the requirements of these fish and the factors that favor or hinder survival of each year's brood to permit a more certain and a more flexible control of the commercial fishery in the interest of wise management.

The investigation has been divided into two major phases—a study of the life of the salmon in fresh water, including the varying success of annual propagation and the factors that affect it and the natural requirements, habits, migrations, feeding conditions, and survival of the salmon during their life in the sea.

With the aid of the United States Coast Guard cutter *Redwing*, a program of hydrographic investigations in the offshore waters of Bristol Bay was undertaken to study the oceanic conditions that so profoundly affect the well-being of the salmon schools. During 1939 this program will be expanded to include experimental fishing to study the schooling of fish, their routes and times of migration, their relative mortality, and the probable effects of the commercial fishery upon the supply. Likewise, a more intensive study of the stream life of the salmon will be undertaken to determine the success or failure of spawning and the responsible factors, in the hope of perfecting a system of prediction of future yields that will simplify the economic exploitation of the fishery and facilitate governmental regulation.

A special fund of $20,000, provided by the appropriation act for the fiscal year ending June 30, 1939, permitted the establishment of another new project of considerable importance. This fund is for the construction, operation, and maintenance of fish screens and ladders on Federal irrigation projects and the conduct of necessary investigations and surveys, preparation of designs, and supervision of construction. It also, for the first time, permits the Bureau to discharge its obligation to determine the requirements for fishways or other fish-protective devices which, under the terms of the Federal Water Power Act of 1924, the Secretary of Commerce is authorized to prescribe at dams constructed under licenses issued by the Federal Power Commission.

With this authority a Hydraulics Section was established, under the supervision of the Division of Scientific Inquiry, employing a competent biologist for the study of fishway requirements and an experienced engineer for the design of the fish-protection facilities. During the latter part of the year the engineer who was first employed not only assisted in the design of fish screens constructed with emergency funds in the Pacific Northwest States, but also redesigned a screen in the Pishkun Reservoir, Montana, which had proved ineffective. Important consulting services on screens and ladders were also afforded to other agencies.

This illustrates a recent trend toward the development of service activities as a part of the regular work of this Division. In recent years there has been a rapidly growing number of requests from the State fish and game commissions, fish and game clubs, and other organizations for technical services and advice in connection with stream surveys, stream improvement, pollution surveys, examination of the quality of water in hatcheries or rearing ponds, development of fishing lakes and reservoirs and the screening of their outlets, discovery of the causes of mortality of fish in lakes, ponds, and streams, the treatment of fish diseases in hatcheries, and the like in amazing variety.

It is clearly recognized that satisfying these demands is a valuable function which the Bureau of Fisheries should render to the taxpayers—services that, because of their technical character, can only be furnished by scientifically trained personnel. There is a serious question, however, to what extent the funds appropriated for investigation in a field which so urgently needs the development of fundamental scientific principles should be applied to routine activities which, while locally useful, contribute little to fishery science. Obviously a balance between original research and these practical services should be maintained, for the requests for service are so numerous that if an attempt is made to satisfy them all the major program of scientific investigatiton would be handicapped.

It is not suggested that the Hydraulics Section will not make important contributions to the conservation of the fish supply, particularly in the Northwest where extensive irrigation projects constitute a major hazard to migrating salmon and trout, nor that the studies in connection with the design of fishways or screens will not contribute also to an understanding of the habits and requirements of these fish. The Hydraulics Section, however, is primarily a service agency and hence is properly financed by a separate appropriation.

Normal development and improvements, including minor modifications or extensions of activities, have occurred in all of the other major research projects of the Division, the details of which will appear in the following reports of progress.

## COOPERATION

In previous reports the Bureau has been pleased to acknowledge a growing spirit of cooperation in fishery research among the various governmental departments, the States, and private organizations. This trend has been continued during the past year without abatement. Outstanding examples of cooperation in fishery conservation are afforded by the United States Forest Service, United States Bureau of Reclamation, the Coast Guard, and the Tennessee Valley Authority. Many States have likewise contributed either by actually furnishing funds, personnel, or other facilities, or through a less tangible but an equally real spirit of sympathy and support.

The most ambitious cooperative project undertaken by the Division of Scientific Inquiry during the year was a survey of the marine fisheries of Long Island, N. Y., the major portion of which program was financed by the State Conservation Department and carried out largely by State personnel. Several of the New England States are making active plans to assist in the collection of vitally necessary fishery statistics applicable to the biological problems of maintenance of supply. Specific acknowledgement of cooperation and assistance of many other States and organizations is made in connection with the individual reports of projects.

### NORTH AMERICAN COUNCIL ON FISHERY INVESTIGATIONS

Since 1921 the United States has participated, through membership in the North American Council on Fishery Investigations, with Canada, Newfoundland, and France in planning and coordinating studies of the fisheries of the North Atlantic area in which all four nations have a material interest. The twenty-fifth meeting of the Council was held in Boston, Mass., on Oct. 4–7, 1938, at the same time and place that the commercial fishery industries were holding their fishery exposition and convention. The Council invited the members of the Fishery Advisory Committee of the Department of Commerce, and other leaders of the industry, to attend a general session on Oct. 5 at which time fishery problems in the North Atlantic area were discussed and the program of fishery investigations carried on by Newfoundland, Canada, and the United States was presented.

The meetings of the Council are particularly useful in that they afford an opportunity for the investigators of the several fishery departments to discuss their technical problems and to exchange experiences and opinions regarding methods, objectives, and results. Nearly a score of fishery investigators in the various services were present and participated in sectional committee meetings dealing with groundfish investigations, shorefish studies, hydrographic research, and fishery statistics, affording the members of the Council a summary review of progress during the year in these fields and permitting them to modify their official programs accordingly.

### COUNCIL OF STATE GOVERNMENTS

During the year important progress has been made toward the solution of vital problems of fish protection on the Great Lakes, where, under the present system of divided control, it is impossible to halt the depletion of the fisheries; and on the Atlantic seaboard, where the migratory nature of many of the important commercial species introduces difficult problems in fishery management and administration. This progress has resulted from the efforts of the Council of State Governments in cooperation with the Bureau of Fisheries and with fishery administrators of the various States concerned.

Two conferences on the problems of the Great Lakes fisheries were held during the year. The first of these, which met in Detroit on Feb. 25–26, was called by the Council of State Governments at the request of the Michigan Cooperation Commission. Action was taken by the Detroit conference as follows: (1) The Federal Government was urged to discuss with Canadian authorities the establishment of an International Board of Inquiry to consider and recommend measures for the conservation of the Great Lakes fisheries. (2) A special Interstate Committee on Great Lakes Fisheries, consisting of representatives of the Lake States, with advisory members from the Bureau of Fisheries, the State Department, the Province of Ontario, and the Dominion of Canada, was appointed with instructions to offer its services to the State Department as an advisory body and to assist the States in their individual and cooperative efforts to conserve the fisheries. (3) A resolution was adopted urging the legislatures of the various States bordering on the Great Lakes to give their conservation departments discretionary power to promulgate rules and regulations regarding the taking of food fishes.

The Interstate Committee created at the Detroit conference met in Chicago on Dec. 5. This committee reaffirmed its endorsement of an international treaty, and also declared itself in favor of an interstate compact for the control of United States fisheries in the Great Lakes, pending the adoption of an international agreement. The committee again urged the granting of discretionary power to State fish and game commissioners as an aid to securing uniform regulations. Commissioners of Wisconsin, Indiana, and Minnesota now have such powers. It is expected that the legislatures of Illinois and Michigan may pass similar legislation in the near future.

Legislation authorizing the formation of an interstate compact among the Great Lakes States for the preservation of their fisheries has now been passed by the Congress of the United States.

Plans for the conservation of migratory fishes of the Atlantic coast received marked impetus from action taken by the majority of the States from Maine to Florida at the Eastern States Conservation Conference held in New York on Nov. 19. A resolution was unanimously adopted petitioning the Congress of the United States to grant permission to the States to enter into a compact for the protection of migratory fishes in territorial waters. A committee was appointed to prepare a draft for submission to the States. This conference was called by the New York Joint Legislative Committee on Interstate Cooperation and all of the Atlantic Coast States, with the exception of New Hampshire, North Carolina, South Carolina, and Florida, sent one or more delegates. Another conference will be called at some future time to consider a specific draft of the interstate compact before efforts are made to secure its adoption and ratification.

## PUBLICATIONS

As was intimated above, a number of important investigations, some of which have been under way for a period of 10 years, have come to completion during the year and reports are now ready for publication. There is considerable doubt, however, at the present time, regarding their probable date of release to the public, for funds available for printing have suffered a progressive decline since 1930. This shortage of funds applies to the publication of the results of investigations by the Bureau as a whole and necessarily restricts and limits the usefulness of the data acquired through many years of work and at the expenditure of a considerable sum of money. In 1930 printing funds amounted to 14.2 percent of the amount expended on the various research projects by the Bureau of Fisheries but this percentage has declined until in 1938 only 4.7 percent of the amount of money available for investigation was available for the publication of the results of investigations. It is obvious that the accumulated findings of research, filed without publication, have little value.

Reflecting the meager amount of funds for publication, the following brief list of papers issued during the year is presented.

DAVIDSON, FREDERICK A., and LEROY S. CHRISTEY.
The migrations of pink salmon (*Oncorhynchus gorbuscha*) in the Clarence and Sumner Straits regions of southeastern Alaska. Bulletin No. 25, 24 pp., 5 figs.

DAVIDSON, FREDERICK A., and SAMUEL J. HUTCHINSON.
The geographic distribution and environmental limitations of the Pacific salmon (genus *Oncorhynchus*). Bulletin No. 26, 26 pp., 9 figs.

DAVIS, H. S.
Instructions for conducting stream and lake surveys. Fishery Circular No. 26, 55 pp., 11 figs.

GALTSOFF, PAUL S., W. A. CHIPMAN, A. D. HASLER, and J. B. ENGLE.
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## NORTH ATLANTIC FISHERY INVESTIGATIONS

### WILLIAM C. HERRINGTON, *in charge*

On the basis of landings at the three principal New England ports during the first 11 months of the year, the total catch of the New England vessel fisheries during 1938 will be approximately 4 percent greater than that during the previous year, but the value will be 9 percent less. The increase in catch is largely the result of considerable increases in the landings of redfish (rosefish), whiting, and mackerel, which more than offset declines in haddock and cod. The decrease in value reflects the decline in price for nearly all species.

The past year also witnessed a general slowing down in the program of replacement of the old steam trawler fleet by modern vessels. During the year, but 3 new trawlers of the so-called super-trawler class were launched, compared with 10 during the previous year. The addition of new boats to the fleet has been partially or completely balanced by the decommissioning of older boats, so that the total intensity of the fishery did not change as much as the construction of new boats would indicate.

Probably the outstanding development in the New England fisheries during 1938 was the recovery of the mackerel fishery to more normal proportions after the disastrous year of 1937, and the start toward the development of a commercial tuna fishery in the Gulf of Maine. From the total of 14,000,000 pounds landed in 1937, the mackerel catch increased to 29,000,000 pounds in 1938; while the offshore tuna fishery showed an increase from around 110,000 pounds in 1937 to about 760,000 pounds in 1938.

The catch of both cod and haddock declined somewhat from that of the previous year, but it has not yet been possible to make a sufficiently complete study of the factors involved to determine whether this decline was due to a decreased fishing effort or to a decreased abundance of fish. Probably the most significant trend in the haddock fishery was toward the greater concentration of the fishery on scrod haddock, a trend which it is believed is definitely prejudicial to the future of the fishery.

Development of a Gulf of Maine shrimp fishery appears to be definitely under way. In the spring of 1938, between February and April, a total of about 75,000 pounds of shrimp was landed at Portland by small otter trawlers which caught them in inshore waters along the coast of Maine and New Hampshire. Smaller quantities were landed at other ports.

In the New England offshore fishery, the principal problems continue to be the determination of the causes of the great fluctuations in yield and the development of methods which, if adopted by the industry, will reduce these fluctuations and maintain the yield at the highest practical level. Although good progress is being made on the species now under study (haddock, flounders, and mackerel), no biological work has been possible on the highly important fisheries for cod, redfish, pollock, and swordfish.

Pressing problems are developing in the inshore fisheries which support the small-boat fishing fleet and coastal population on long stretches of the North Atlantic coast. The most important problems here involve the improvement or maintenance of fisheries for flounders and lobsters, and the development of the fishery for shrimps.

Several important changes in the personnel of the North Atlantic staff were made during the year. J. R. Webster was assigned to continue the mackerel investigations, following the transfer of O. E. Sette to the West coast in October 1937, to assume charge of the Bureau's South Pacific Investigations. In January 1938, M. J. Lobell was transferred to this staff to carry on an investigation of the important flounder fishery; and in March 1938, Dr. G. A. Rounsefell also was transferred to carry on a comprehensive study of fluctuations in the abundance of North Atlantic groundfish, a problem which has demanded attention for some time.

The headquarters of the North Atlantic Fishery Investigations has remained in Cambridge and Boston, Mass. Harvard University has generously provided the staff with space and facilities in its biological laboratories. The cooperation of the Woods Hole Oceanographic Institution is gratefully acknowledged, as is the personal advice and interest of Prof. Henry B. Bigelow. The assistance and cooperation of fishermen and dealers in providing the use of their records, and in other ways, is also acknowledged with pleasure.

## HADDOCK

The past year witnessed the continuation of several trends discussed in previous reports, but no noteworthy innovations or developments. Catch records for the first 11 months of 1938 (the only months yet available), show that the total amount of haddock landed at Boston, Gloucester, and Portland reached 138,000,000 pounds, a decrease of about 3 percent from the previous year; while the value was a little over $3,000,000, a decrease of 15 percent from the previous year. This is the third successive year of decline in catch and the second successive year of decline in value since 1935.

The replacement of the old steam trawler fleet with new Diesel-powered boats continued during 1938, but at a slower pace than in 1936 and 1937. Two new trawlers launched late in 1937 began fishing in 1938, and three others were launched and placed in operation during the late fall and winter. However, these additions to the fleet do not necessarily mean a greater fishing intensity since they were probably more than counterbalanced by the decommissioning of old steam trawlers. The total number of trawler days at sea was somewhat less than in 1937, but the increased effectiveness of the new units probably compensated for much of the decline and it is likely that more detailed analysis will show that there was little change in absolute fishing intensity between 1937 and 1938.

The trend toward the increased utilization of species other than haddock continued, but at a much lowered tempo. These species, which in 1929 made up 34 percent of the landings of groundfish, in

1938 constituted about 64 percent. This change in the make-up of the catch is due primarily to the great increase in recent years in the landings of redfish (rosefish), whiting, cod, pollock, and grey sole. To a lesser extent it is due to the decline in the catch of haddock.

Another trend which was continued in 1938 was the increased concentration of fishing on scrod haddock, when these sizes were available. During the first 11 months of 1938, 45 percent of the haddock from Georges Bank were scrod, compared to 35, 38, and 36 percent during the 3 previous years and even lower percentages prior to that time. This appears to be definitely prejudicial to the future, inasmuch as haddock of this size still are growing rapidly and would be of considerably more value to the fishermen because of increased weight and increased value per pound, if allowed at least 1 more year's growth.

As a result of rather erratic exploitation and of natural factors which were neither understood nor even known, the catches of haddock have varied tremendously in different years, indicating a high degree of fluctuation in abundance or availability. Following 1927 the average catch per boat declined to an alarming extent (although the total catch was maintained until 1929-30 as the result of a great increase in fishing effort), and since then, has remained at a relatively low level. The fishery on the Nova Scotian banks has followed about the same course and the effects have been much the same.

The principal problems of the haddock investigation, from its inception, have been to determine the extent and causes of these great fluctuations, and to determine what practical modifications in fishing methods or procedure could be adopted in order to partially or entirely eliminate the periods of low productivity. The final problem was to develop a plan for prosecuting the fishery which, if adopted by the industry, would permit the maximum continuous catch from the area.

Analysis of extensive data collected during the course of the investigation has explained many of the factors controlling the condition of the fishery. During the period under most intensive study, the total catch increased from about 60,000,000 pounds in 1921 to nearly 250,000,000 in 1929, then dropped to about 140,000,000 in 1932 with some relatively limited increases and decreases since then. On the average, about 72 percent of this catch came from the Georges Bank area. In this region, the abundance of haddock, as shown by the average daily catch per trawler, had decreased rapidly from a relatively high level in 1921 to a low point in 1923, and had then risen precipitously to a peak in 1927. Since that year there has been a decline to an extremely low level in 1931, with little recovery since. The changes in this apparent level of abundance, particularly the low levels maintained since 1932, were due partly to the changing intensity of the fishery; but the relative success or failure of year-class survival appears to have been a very important factor. Years of good and poor survival appear to occur in cycles, the causes of which are only beginning to be understood.

Independence of the haddock population in the Georges area from that on the Nova Scotian banks has been apparent. During the first two or three years of life, the growth rate for Georges fish is much greater than for haddock from the banks to the east; while in later years, the advantage is reversed. In most of the years for which data are available, the size composition of the populations in the two areas was entirely different.

The principal spawning ground in the Georges area is on the eastern part of Georges, although, in some years, there has been a considerable concentration of spawners in South Channel. The principal nursery ground for one-year haddock is on southeastern Georges, while the other fish move further to the north and west as they grow older. These sizes also carry on much more extensive seasonal migrations (within the limits of this area) than the yearlings and 2-year olds.

*Progress in 1938.*—The investigation has continued under the direction of W. C. Herrington assisted by H. M. Bearse and M. S. Moses with assistance from J. R. Webster and G. A. Rounsefell on the *Atlantis* trawling trip, and from the latter on a tagging trip to the Maine coast.

Dependable figures for total catch and relative abundance, by years and areas, have been and continue to be of primary importance to this investigation. For the past several years, it has been evident that recent data on relative abundance obtained from analysis of the haddock catch alone might not be entirely comparable to earlier years, because of the increasing importance of other species in the catch of the otter-trawl fleet. Although about 1929 haddock made up 60 to 70 percent of the catch of this fleet, in 1936 it comprised only about 36 percent. To determine the extent to which this increase in the catch of other species would affect the unit of fishing effort as applied to haddock alone, a comprehensive analysis of the entire catch taken by the fleet was necessary. During 1938, such analysis of groundfish catches was undertaken by Dr. Rounsefell. Since this work did not get under way until well on in 1938, no data are yet available as to the relative level of haddock abundance in 1938, or changes that occurred from 1937 to 1938.

Field work during 1938 consisted principally of the regular observations on the Boston Fish Pier and a trawling trip on the *Atlantis* in April–May. Data collected on the Fish Pier by H. M. Bearse included more than 55,000 length measurements, 3,000 scale samples, and interviews showing fishing grounds, fishing effort, and division of catch for all groundfish trips. The *Atlantis* trawling trip was under the direction of J. R. Webster assisted by G. A. Rounsefell and H. M. Bearse. Records were obtained covering "catch-per-hour's-trawling" for haddock and other species, and data were obtained concerning length, sex, and age for all haddock as well as for part of the cod and other species.

*Analysis of abundance.*—Original records for the otter-trawl fishery from 1914–22 have now been acquired. These new data are of inestimable value, as they include information on the scrod catch not previously available. Primary analysis of the data for the entire period 1914–37 has been virtually finished. When completed, this will show the average catch per trawler per day of large haddock, scrod haddock, and total fish, for a series of years extending from the time when the commercial fishery was relatively small to the present extremely intensive fishery. Preliminary conclusions from these data indicate that cycles of relative scarcity and abundance have appeared in the haddock populations over the entire period, which is marked by three periods of scarcity and two of abundance. Periods of abundance apparently result from a series of years with a high survival of young, while periods of scarcity result from a series with a poor survival. The years since 1930 are an exception, for since then the level of abundance has remained relatively low in spite of the consistently good production and survival of young. This condition appears to be the result of the increased intensity of the fishery in recent years. Cycles of good and poor survival of young appear to be related to the abundance of adults on the nursery grounds, the most favorable level being approximately that which prevailed in 1922 to 1924, 1929, and 1936.

These developments indicate that we are now approaching the stage where it will be possible to explain the causes for the great cycles of abundance which have been observed in the haddock fishery. It appears that the cycles of abundant and poor year classes are related to the varying abundance of large fish on the banks. Poor production or survival of young may result either from an overabundance of adults on the nursery grounds or from too great a reduction in the spawning stock. If the completed analysis of the material substantiates these indications, it will provide information of tremendous value toward development of a consistently good yield.

*Population composition.*—A considerable amount of information concerning the abundance and distribution of haddock was obtained from the trawled material taken on the spring *Atlantis* trip. One- and two-year fish were abundant, but older fish were relatively scarce. The 1-year fish were distributed about as in previous years, but 2-year fish, which previously were found in great numbers on Central Georges, in 1938 were almost entirely absent from this region. They were found in large numbers only on southeastern Georges and in South Channel. The latter location was particularly unusual, as but few fish of this age had been found there in previous years.

*Tagging.*—Early in this investigation a series of tagging experiments was carried out, using haddock held in tanks and live cars to determine the most satisfactory tag for this species. A variety of special tags were tested in addition to the disk type (plaice label) and strap tag used by other investigations. The experiments indicated that a button type was most successful with the disk type almost as good. This work was followed by field experiments in 1932-33, involving the tagging from otter trawlers of 440 haddock with button tags and 52 with belly tags, and from line trawlers of 296 with button and 117 with belly tags. No returns were received from any of these experiments except for one button tag from the line-trawl tagging. In view of the successful retention of tags in the live-car experiments, it appeared that the failure of the offshore work was the result of high mortality due to the gear and depth. Experiments next were tried from small line trawlers in shoal water along the Maine coast. In this attempt, 296 button and 117 belly tags were attached. There were 6.4 percent of the button and 6 percent of the belly tagged fish recaptured and reported.

Owing to limited personnel and funds, no further work could be done on this subject in spite of its importance until Dr. G. A. Rounsefell took charge of the work in 1938. In June of that year, 265 haddock were tagged with button tags, 266 with disk tags, and 100 with an internal anchor tag designed by Dr. Rounsefell. Tagging was done near Mt. Desert Island from a small line trawler. It is planned to continue the work next year on a sufficiently large scale to provide significant conclusions concerning the intermigration between the population of Maine shore haddock and that on the offshore banks.

*Principal requirements of the investigation.*—The most urgent matters now facing the investigation are the completion of the study of variations in haddock abundance and total catch, analysis of the age and size composition of the commercial catch to show the effect of year-class strength on the fishery, study of the differences in growth rate between different year classes and fishing grounds, and the determination of the extent of intermigration between the various grounds. The first is now well on the way toward completion, but, although considerable progress has been made on the others, the work has been greatly handicapped by the lack of vessel facilities for collecting basic data on the offshore fishing grounds. The generous cooperation of the Woods Hole Oceanographic Institute in providing the occasional use of the *Atlantis* at nominal cost to the Government has been of great help, but to no considerable degree has this served to displace the need for a vessel built and equipped for otter trawling and hydrographic duties and regularly assigned to fisheries work. Such a vessel is particularly needed for a systematic sampling of the young fish population at least twice a year to evaluate the distribution and abundance of each year class before it reaches commercial size; determine its mortality rate from natural causes and from the commercial fishery; and study the growth rate of the young fish.

A vessel is urgently needed to carry on further work on offshore tagging. Adequate experiments should provide data of great value concerning haddock migrations, growth rates, and mortality rates. Preliminary attempts to carry on the work from commercial vessels have proved to be a complete failure (except from small line trawlers along the Maine coast), presumably because of the high mortality of the fish resulting from the effects of the commercial gear. It does not appear that these difficulties can be overcome without the use of a research vessel to develop and use special methods for catching and handling the fish.

### MACKEREL

The 1938 mackerel season began late in March, and, because of growing emphasis on winter activity following the 1937 failure, was still in progress at the end of the year. Total vessel landings for the season will be approximately 29,000,000 pounds, about double the 1937 catch. Prices dropped back to the 1936 level, close to 2½ cents a pound, at principal New England ports. In general, fishermen fared better than in 1937.

Throughout its history the mackerel catch has been characterized by extreme fluctuations in yield. The mackerel investigation was undertaken to study the causes of these fluctuations, with a view to devising means of predicting the relative abundance of mackerel in advance of the season.

To provide a basis for understanding changes in abundance, catch statistics have been assembled covering the fishery from its inception—about 1804. These figures reveal a period of high catch level, lasting from about 1820 to 1885. During this time the landings averaged roughly 80 to 100 million pounds annually, but were subject to violent fluctuations. The year 1886 ushered in a period of poor catches, lasting until the present day. In no year during this period have landings exceeded 65,000,000 pounds, while the annual average has been nearer 40,000,000 pounds. This low level has persisted so long as to be considered normal. However, the yearly fluctuations during the latter period, though less in amount, were as great in degree as those within the former period.

Investigations of mackerel behavior and life history have demonstrated that these fish range from the Middle Atlantic States to Canada. They school mostly over the inner portions of the continental shelf, generally avoiding small enclosed bays and regions over deep water. Analysis revealed two contingents in the population; one ranging between the offing of Chesapeake Bay and the Gulf of Maine and the other between southern New England and the Gulf of St. Lawrence. Both contingents probably spend the winter in offshore areas near the southern portions of their range.

Spawning occurs between April and August. Fish grow 7 to 10 inches the first season, and attain a length of 10 to 14 inches by the end of the second year. Thereafter, growth is slower. The maximum life is 12 to 15 years, length about 22 inches, and weight from 3½ to 4 pounds.

Fish from one or a few year classes usually make up a season's catch, and persist as definite groups for many years. Discovery of this fact led to the belief that the numerical strength of these dominant year classes determines the success of the commercial fishery. On the basis of year class recruitment and mortality the investigation succeeded in forecasting the approximate yield for several successive years. In 1937, however, the mackerel catch fell about 40 percent below the predicted decline, indicating that some unknown factors were at work.

*Progress in 1938.*—The current mackerel investigations, now under the direction of John R. Webster, have been devoted to completing and bringing up to date the lines of investigation initiated by O. E. Sette, and to determining the factors which caused the relative failure of the mackerel fishery in 1937.

The abundance analysis for 1937 was based on more than 1,500 catch records and 35,000 length measurements. As shown by catch per unit of effort, abundance fell off everywhere along the coast. Compared to 1936, this decline was not much more than 30 percent for the area west of Nantucket Shoals, but exceeded 50 percent in the Gulf of Maine area.

Study of lightship temperature records revealed that the surface waters of the extreme western Gulf of Maine in 1937 ran from 2° F. to 7° F. higher than those of the previous 10-year average. The departure from this norm was greatest during that portion of the mackerel season when the fleet operated in these waters. Since the offshore fishery fell so far below expectations during this period, it is suspected that hydrographic conditions were a factor in the decline.

Composition of the whole mackerel population in 1937 apparently differed from that of previous years since 1925. Analysis of length-frequencies furnished strong evidence that the 1923 year class was still present, and probably the 1928 class as well. Except for the 1932 class, year classes following 1929 were present in better than 5 percent strength each. None of these stood out as dominant, however, a real departure from conditions only a few years before.

Field work during 1938 was conducted principally by F. E. Firth. This included details at Cape May and New York City in April and May, and at the Boston Fish Pier for the remainder of the year. Information on fishing effort and catch locations was obtained for over 1,000 trips and about 50,000 mackerel were measured for population composition analysis. In addition, 700 scale samples were taken for age reading reference. Late in June, Mr. Webster tagged 500 mackerel at Provincetown. There were but 5 returns, all local, within 1 week.

Preliminary studies of the 1938 catch show that the 1936 year class made large contributions to the fishery, with the combined groups of 1934 and 1933 next in importance. Detailed analysis of these data will be undertaken in 1939.

The present tendency of the seining fleet to extend both ends of the season may make necessary some changes in methods of determining abundance. For furthering studies of hydrographic conditions, it appears advisable also to obtain a more representative norm of coastal surface water temperatures. If temperature be a real factor affecting the availability of mackerel, some measure of its significance must be found. Although some advance in the solution of these problems can be made with our present facilities, expansion is necessary in order to solve others. Direct evidence is needed of the fate of certain year classes which decrease in availability faster than others. The cause may be heavier mortality or mass changes in habitat through migration. A large-scale tagging program is needed to determine this point. Further study is needed also for an understanding of the relationship between the mackerel catch by purse seiners and pound nets in the same locality. Catch statistics alone are insufficient, since it is necessary to learn when these two types of gear sample the same or different populations and why. The aid of part-time assistants at strategic points is needed to collect such information.

The mackerel problem now appears to involve more than a study of year-class recruitment and mortality. Events of the past 2 years have emphasized the need for particular knowledge of oceanic conditions affecting the mackerel fishery. In view of these facts, it is believed inadvisable to attempt forecasts of future abundance until facilities for determining these conditions are provided.

### FLOUNDER

In 1935, the last year for which complete figures have been compiled, the total North Atlantic catch of all species of flounders amounted to about 39,000,000 pounds, and was worth approximately $1,500,000. Five species compose the bulk of the catch. They are: (1) Lemon sole (*Pseudopleuronectes dignabilis* Kendall); (2) gray sole or witch (*Glyptocephalus cynoglossus* Linnaeus); (3) winter flounder or blackback (*Pseudopleuronectes americanus* Walbaum);

(4) dab (*Hippoglossoides platessoides* Fabricius); and (5) yellowtail (*Limanda ferruginea* Storer.) In addition, the fluke (*Paralichthys dentatus* Linnaeus), the four-spotted flounder (*Paralichthys oblongus* Mitchill), and the smooth flounder (*Liopsetta putnami* Gill) are landed in some quantities. Because of variations in life history and habitat, each of these species represents a different problem.

Studies of winter flounders previous to 1938 were confined largely to tagging experiments. In 1931, R. A. Nesbit tagged a number of flounders at Woods Hole and devised the present methods of flounder tagging. Returns indicated that the winter spawning population dispersed in various directions during the spring and summer, and that long migrations were undertaken by some individuals. In the following winters many of these tagged flounders were recaptured at the original tagging area. During 1937, a number of fish were tagged in Rhode Island and in Great South Bay, Long Island. The recoveries from these experiments indicated a high intensity of recreational fishing. As before, returns indicated a dispersion from the tagging point. Little migration from Rhode Island waters occurred, a few fish being recovered in the Nantucket region. Significant numbers of fish tagged in Great South Bay were recovered at considerable distances from the tagging area, some individuals being taken as far away as Nantucket Shoals.

In January 1938, Milton J. Lobell began an intensive study of the flounder fisheries of the North Atlantic area. The most pressing problem facing this investigation is to determine whether a decline in abundance is in progress. If the decline is serious, the reasons for it must be found and methods developed for a more efficient utilization of the stock. Determination of the total catch and catch per unit of effort must be made to cover as long a period as possible in order to determine the condition of the stock and the fluctuations in the fishery. To find the reasons for fluctuations in abundance or availability, various biological factors must be studied. These include the racial composition of the stock, age and growth, migrations, and many other problems that affect the abundance and availability of the species.

*Statistics.*—The first available figures for the North Atlantic flounder fisheries are for the year 1887. During this year a total catch of about 2,500,000 pounds was recorded. The peak year for flounder landings occurred in 1928, when approximately 51,000.000 pounds were reported. The years 1929 and 1930 were also important, since landings of about 49,000,000 pounds were made in each of these years. Although the value of the fishery cannot be accurately determined for the earlier years, in more recent times a basis of estimation is furnished by the value of flounders landed at the three principal New England ports, Boston and Gloucester, Mass., and Portland, Maine. In 1928, a 10,500,000 pound catch landed at these ports was valued at $511,296. Since the total reported catch in 1928 for the whole region was about 51,000,000 pounds, or approximately 5 times as much, it can be conservatively stated that the value of the fishery was well over $2,000,000.

The catch by species was given for the first time in 1937 in the statistical reports of the Bureau for the three principal New England ports. Gray sole landings were almost 8,000,000 pounds;

yellowtail about 4,000,000; lemon sole, 2,500,000; dabs, 2,500,000; and winter flounders slightly over 1,000,000 pounds. These figures, however, are not indicative of the total amounts landed by the entire fishery, or even of the proportions of the catch contributed by each species in New England and New York. Contrary to the situation prevailing north of Cape Cod, the bulk of the flounder catch south of the Cape is composed of winter flounders. Annual canvass figures for this area showed a decided decline, the landings having dropped about 37 percent from 1930 to 1935. Fishermen and dealers report a definite decrease in the average size of the fish. During the past 5 years an enormous sports fishery for winter flounders has developed south and west of Cape Cod, and particularly in Long Island. In some places the catch equals or even exceeds that of the commercial gear. In view of the decline of commercial catches of the winter flounder and the rising importance of the sports fishery, the work of the flounder investigation has been concentrated on this species.

Detailed and accurate statistics of the catch of winter flounders are not available for past years, owing to the fact that all species landed were lumped together, with no record of seasonal occurrence or grounds fished. In 1938, however, the Market News Service, with offices in Gloucester, Portland, Boston, New Bedford, Provincetown, and New York City, was able to furnish more complete and detailed statistics than could be procured formerly. In addition, the State of New York, through its Long Island Survey, collected much needed and detailed information on its fisheries. The State of Maine will adopt a statistical system in the early part of 1939, and other New England coastal States are expected to undertake a like program. With cooperation from these States, it will be possible to obtain more satisfactory data in the future.

*Tagging.*—In cooperation with the States of New York and Connecticut, about 2,000 flounders were tagged in Long Island Sound and in a number of localities on Long Island. Fish were tagged in Great South Bay, Great Peconic Bay, Gardiners Island Sound, Port Jefferson, and Huntington Harbor in New York waters. In Connecticut, tagging of the local stock was conducted in the Mystic River and of the breeding stock at the Noank Hatchery. As in previous experiments, the twin disk celluloid tag was used. These were fastened just posterior to the head and below the dorsal fin of the fish by means of nickel pins.

These experiments yielded valuable information on the movements of flounders and the relative intensity of the commercial and sport fisheries. The peaks of returns occurred from April to May and from October to November, indicating either that the fish were more available at that time or that fishing was more intensive. In general, an offshore movement in the spring and an inshore movement in the fall occurred. Summering concentrations in the Block Island region were composed of individuals from Long Island, Connecticut, Rhode Island, and the south shore of Cape Cod. Recoveries from Nantucket Shoals suggest that the offshore banks may be partially populated with fish from inshore grounds. Although a general dispersion of fish was indicated, evidences of directional migrations also occur, since it was found that in a number of cases minimum speeds of over 4 miles a day were recorded. The recovery of a large number of tags by recreational fishermen indicated that this type of gear took almost as many fish as the commercial gear in the tagging areas. Since year-round recoveries were made near the tagging locality, while seasonal recoveries occurred from points relatively far removed, it may be concluded that racial types, or at least groups with differing summer habitats, exist.

*Age and growth.*—Scale samples from Long Island flounders collected by the Long Island Survey and from Narragansett Bay, supplied by the Narragansett Marine Laboratory, were prepared, read, and the results partially analyzed. Particular attention was paid to the Long Island collection, since these data will be of value in connection with the survey conducted by the State of New York.

It was found that length frequencies, except for the 0-group and to some extent for the I-group, were useless in determining ages of flounders because of the multi-moded character of the length frequencies of fish other than the 0-group. Examination of the scales proved to be more enlightening, although the reading of some scales was complicated by false checks, double checks, and regeneration marks. Comparison of age and length availed but little, since oftentimes fish with two definite checks might be larger than fish with three definite checks, even in the same sample. In addition, it was found that females were consistently larger than males of the same age. Samples from one area showed growth rate differences when compared to samples from other regions. This evidence definitely indicates that the population of flounders is composed of groups with varied growth rates and possibly different habits in other respects. In general, the size at each age is: End of first year, 4¾ inches; end of second year, 7½ inches; end of third year, 9⅞ inches; end of fourth year, 11½ inches; end of fifth year, 13 inches; and end of sixth year, 13¾ inches.

*Races.*—In addition to positive evidence of the existence of separate races from tagging recoveries and age and growth studies, examination of the characteristics of juvenile fish also indicates that differences exist. These differences are in the length-width ratio, degree of twist in the snout, angle of head profile, location of the eyes, and ratio of head length to total length. Preliminary findings suggest two types of flounders: A thin, narrow-bodied type with the snout sharply twisted, a low head profile and a large head; and a relatively thick, wide-bodied type with a straight snout, high head profile, and small head. It is thought that these two types represent the offshore and inshore races, since both groups are known to spawn in the same general areas.

These general lines of investigation will be continued in the future, with emphasis on the collection of detailed and reliable catch statistics and on a thorough study of the life history.

## ANALYSIS OF GROUNDFISH ABUNDANCE

Analysis of groundfish abundance was undertaken early in 1938, under the direction of Dr. George A. Rounsefell. For some time the need of this work has been increasingly apparent because of serious problems created by this rapidly expanding fishery.

New England landings of fish and shellfish from 1930–35 (excluding 1934 for which figures are not available) have averaged

611,000,000 pounds annually, of which 437,000,000 pounds consisted of the various species of groundfish. Fluctuations in the abundance of haddock, which comprised about 45 percent of the catch during the above period, have been determined as part of a biological study of the species, but no information has been available concerning the other species—cod, pollock, hake, cusk, wolffish, whiting, halibut, rosefish, and the various flounders. During recent years the industry has been developing markets for all species, bringing about a marked change from former years when boats sought only haddock, and took other species but incidentally. This means that the total catch of any one species is now partially dependent on the abundance and market value of the others.

Various other factors must be considered in an analysis of groundfish abundance. For example, in a fishery that draws upon several species, the relative abundance of any one species is not necessarily indicated by the average catch of that species per unit of fishing effort. The average catch must be qualified by such information as the depths and grounds fished and the quantities of other species caught, so that it is clear whether the fishing effort was directed toward the catching of the species in question, or whether the average cited is merely of catches made incidental to the pursuit of another species. For example, the vessels seeking rosefish trawl exclusively in the deeper waters, around 70 to 100 fathoms. Only an occasional rosefish is taken in shallow water, and these fish are not caught in commercial quantities at medium depths. Therefore, a low catch of rosefish per unit of effort in shallow-water zones would not indicate a low abundance of rosefish in general. As another example, although the gray sole is taken to some extent at lesser depths, the bulk comes from certain types of bottom in the deeper water. The lemon sole, on the other hand, is abundant only in shallower areas. These differences in habitat have raised several problems of analysis, the solution of which is treated more fully below.

Another major problem is the study of the changes in the fishing fleet in respect both to numbers and to size and type of vessel, in order to gain a measure of the total fishing effort expended. For a great many years nearly all of the groundfish were taken with hook-and-line, but in the last 20 years there has grown up a huge and expanding otter-trawl fleet. At the same time, the number of line trawlers has gradually decreased until they are now a minor factor in the fishery. Changes in the vessels affect not only their efficiency in respect to their chosen type of gear but also their adaptability to other gears. Many vessels are so constructed that it is possible to shift to whatever gear is producing the greatest monetary reward at the moment. This adaptability means that there exists a great potential capacity to take any particular species. Although this capacity is seldom exercised to any great extent, owing to an economic balance, the ability to shift fishing effort from one species or fishing bank to another must be realized and fully considered before judging the effect upon any species of changes in the abundance of another.

The total catch during this period of expansion has remained at a high level, owing principally to two developments in addition to the increase in number and efficiency of the fishing vessels. One important factor in maintaining the poundage has been the shift to other species, such as the rosefish. From 1930–35, this species contributed but 4,000,000 pounds a year, but in 1936–38 it averaged over 60,000,000 pounds. The rosefish is now sold throughout the Midwest and South as frozen fillets of "ocean perch." Another factor has been the increased dependence of the vessels on the banks off the Nova Scotian coast. Even if these banks can stand considerably more fishing, their distance from port means greatly increased cost of production. In the past few years there has been a great increase in the amount of trawling in deeper water, out to the 100-fathom curve and beyond, because of the demand for rosefish and gray sole. Since most of the available banks and most of the commercially abundant species are now being fished, it becomes increasingly clear that the future of this huge fishery depends upon utilizing the present banks and species to the best advantage.

The main problem then is to assess the three variables, total catch, fishing effort, and abundance, in order to determine for each species whether it can yield larger quantities or whether it has already reached the point where an increase in yield will give a larger production only at the expense of the future.

For this task the investigation has access to the following records: The poundages landed by species by each vessel for each trip from 1918 to date at Portland, Gloucester, and Boston (except for Boston landings at T Wharf) are available. For the vessels of over 50 gross tons, the actual weighed-out weights are given, but for the smaller vessels (5 net to 50 gross tons) the Boston records and some of the other records are hailed weights (i. e., estimates of the catch made by the captain when the trip is put up for sale at auction.) Since 1928, each slip also shows the type of gear the vessel employed in making the catch.

The record of the total annual catch by species of each fishing vessel (i. e., boat over 5 net tons) in New England since 1928 has been made available through the cooperation of the Division of Fishery Industries. These records are obtained by canvassing the fishermen themselves once a year to determine their catch. These records also show the gear used by each vessel, and, when more than one type is used, it shows the amount of each species caught by each type.

Since 1932, the haddock investigation has maintained a man at the Boston Fish Pier to interview the captain of each groundfish vessel, of over 50 gross tons, each time the vessel lands. These interviews give the day and hour of departure from and arrival at the pier, the locations fished by rectangles covering 10 minutes of latitude and 10 minutes of longitude, the depth fished, the proportion of the fishing time spent on each bank, and the proportion of the fish caught on each bank.

*Analysis of abundance.*—The methods used in analyzing these records for the haddock investigation are in general applicable to the groundfish analysis (which will in the future include the portion of the haddock investigation dealing with abundance), but had to undergo certain modifications on account of the tremendous mass of data to be handled and the differences in habits between the various species to be studied.

Through a project of the Works Progress Administration it was possible to obtain several needed assistants. The large accumulations of catch-record receipts for the 21 years from 1918–1938 have all been sorted by month according to vessel and type of fishing gear, and filed so as to be readily accessible.

Using these records of landings in conjunction with the information obtained at Boston from interviews with fishing vessel captains, the relative abundance is being calculated for each species for the 7-year period 1932–38 from records of selected groups of otter trawlers. The procedure followed by the haddock investigation of subtracting running time of the vessel to and from the fishing banks, as well as time lost by bad weather, etc., in order to calculate the time spent in fishing on each bank, has been retained.

In order, however, to take care of the differences in the depth habitat of the various species, the banks have been divided into three depth zones, namely: Shallow, 0–30 fathoms; medium, 31–60 fathoms; and deep, over 60 fathoms. The allocation of catches into depth zones has been simplified by using the 10-minute unit area rectangles mentioned above.

The increased fishing for rosefish and gray sole in the deep zone within the past 3 years, the inauguration of depth zones, and the analysis of additional data concerning fishing grounds obtained since 1936, made it advisable to revise the statistical subarea boundaries in International Areas XXI and XXII. These were reoutlined on the basis of 39,632 days' fishing, in the various unit areas. Three subareas were eliminated from Area XXII by amalgamation and many minor adjustments were made in an attempt to simplify the analysis of the data by adjusting the boundary lines to the natural fishing concentrations. The handling of this large mass of data has been simplified by the use of cards which permits wide latitude in the grouping of areas or depths, and is invaluable in the assembling of the material for correlations.

The current analysis of these data, starting January 1, 1939, will be tabulated by the punch-card system that has been used for some years by the Bureau in the preparation of the monthly bulletin on the landings at Boston, Gloucester, and Portland by type of gear, species, and fishing bank. The punch card has been revised and the depth zone and calculated fishing time added to the information previously punched. Mr. Bearse interviews the vessel captains, and, by means of these interviews, supplies the Division of Fishery Industries' agent with these additional data. By this means it will be possible to obtain current data on abundance, which, despite its usefulness, is available for very few fisheries.

*Total catch by areas.*—A knowledge of the relative annual abundance does not permit any estimate of the productive capacity of a stock of fish without information on the total catch.

The landings of fishing vessels of over 5 net tons at Portland, Gloucester, and Boston (except for Boston landings at T Wharf) are shown both by type of gear used and by the subareas (fishing banks) where caught, in the monthly bulletin of the Division of Fishery Industries. However, these comprise but 65 percent of the New England groundfish landings.

The only records of total catch available for New England have been those of the Bureau's annual canvass; but, besides not being taken in some years, they cannot achieve a high degree of accuracy because a large share of the individual fishermen from whom the estimates are obtained do not keep accurate records. In addition to this disadvantage, the annual canvass totals do not show either the season at which the catch was made, or the banks from which it was derived.

In cooperation with the Division of Fishery Industries and other members of the North Atlantic staff, an attempt has been made to encourage the New England States to install systems of collecting more complete and accurate statistics than those now available. One of the best systems for collecting such statistics is the use of triplicate receipt books by every fish buyer, so that a copy of each purchase showing the weighed-out poundage of every trip is available to the dealer, the fisherman, and the State. Such a system has been in use in California since 1915 and has been eminently successful.

The State of Maine inaugurated such a system on January 1, 1939, and the Bureau is aiding in getting it under way. Other New England States also are becoming more interested in obtaining better statistics of their fisheries, and the Bureau is encouraging and cooperating in the installation of such systems.

The fact that a fair share of the New England groundfish catch not landed at the three principal ports is caught in the inshore areas (as opposed to the large quantities from the offshore banks landed at the three ports) is shown by a preliminary analysis of the annual canvass vessel schedules which has revealed a large fleet of small vessels operating largely in shallow, inshore waters, and fishing primarily for flounders. These small flounder vessels are most numerous south of Cape Cod, although some land at Boston and Gloucester and along the coast of Maine. The catches of these smaller, inshore vessels will be analyzed by the flounder investigation as they will necessarily have to be correlated with the life-history findings.

*Composition of the fishing fleet.*—The fishing vessels have undergone many changes in size, power, and type. As explained above, these changes in the number and type of the fishing vessels must be known if one is to judge either the relative difference in annual fishing effort or the potential fishing effort that can be unleashed in any particular direction whenever economic conditions warrant. Furthermore, without knowledge of the total fishing effort, it is not safe to assume that the relative catch from year to year of a particular amount of fishing effort is not influenced by differences in the amount of competition with other vessels fishing the same grounds.

Since 1928, the weigh-out schedules for vessels landing at the three principal New England ports have given the type of gear used in making each catch. These data (available for over 700 vessels) are being analyzed to show the number of vessels of each size and type of gear that fished during each month over this period of 11 years. A preliminary tabulation of a few of the years during which New England annual canvass data are available, showed over 260 additional vessels that landed only at minor New England ports. These latter vesels were chiefly small inshore flounder trawlers and gill-net boats, although a few fair-sized vessels are included from Provincetown and New Bedford.

## MIDDLE AND SOUTH ATLANTIC FISHERY INVESTIGATIONS

R. A. Nesbit, *in charge*

In Progress in Biological Inquiries for 1937 it was pointed out that the fisheries of the Middle and South Atlantic States offer an opportunity to benefit from scientifically controlled management. Increases in the amount of gear operated have diminished profits by increasing the cost of fishing and decreasing the yield. The problem of correcting excessive fishing and waste of small fish cannot be solved by individual fishermen. The responsibility rests on conservation officials, State and Federal, to advise fishermen what corrective measures they must support in their own interest.

The reduced abundance which has resulted from overfishing has also caused widespread dissatisfaction among anglers. Many of them, made impatient by the long delay in devising and adopting sound conservation measures, are advocating drastic curtailment and even elimination of commercial fishing for certain species. Legislation to this effect has been introduced in several State legislatures. Other anglers recognize that most marine species are capable, under sound management, of supporting a prosperous commercial fishery without detriment to angling interests, and are supporting the Bureau and State conservation organizations in their efforts to serve the common interests of commercial producers, anglers, and the consuming public.

The problem is twofold; to determine what measures are needed and practicable, and to provide for a unified or coordinated means of putting them into effect. The Council of State Governments is sponsoring a proposal to provide for the necessary cooperation in research and administration through an interstate advisory body created under the provisions of an interstate compact. Preliminary meetings were held during the year and a committee is preparing a draft of a compact for consideration by the several States and by Congress.

As in 1937, the courtesy of the University of Maryland in furnishing laboratory facilities at College Park, and of the Charleston Museum for similar accommodations in Charleston, S. C., is gratefully acknowledged.

### SHORE FISHES

During 1938 the study of the shore fishes of the Middle Atlantic States was continued by William C. Neville. These investigations consisted principally of observations on the winter trawl fishery off the Virginia Capes, and cooperation with New York State in a biological survey of the marine fishes of Long Island.

*Long Island Survey.*—The Bureau participated in the Long Island Survey at the request of the New York State Conservation Department, acting principally in an advisory capacity. Mr. Neville, who was assigned as the Bureau's representative, spent most of the period from January to December on Long Island assisting the New York State biologists in the supervision and conduct of this work. Mr. Nesbit also served in an advisory capacity and Milton J. Lobell gave active support in certain phases of the study of the winter flounder. Mr. Neville assisted in the preparation and editing of a report on results of the survey, Mr. Nesbit preparing the section on squeteague and Mr. Lobell that on the winter flounder. The Bureau assigned the *Phalarope II*, with Joseph Armstrong as engineer, from the Woods Hole, Mass., station to Long Island from May 1 to July 1. This boat was used in a survey of the young fish populations of the bays and inshore coastal waters of that region. Some scientific equipment and miscellaneous supplies were also furnished by the Bureau.

The main objectives of the Long Island survey were: (1) To provide information that could be used as a reliable basis for improving or maintaining good fishing insofar as the factors affecting the supply are controllable, and, (2) to determine by a census of fishing activities the recreational and commercial value of the marine district of Long Island to the citizens of New York State. Particular attention was given the winter flounder and squeteague because of the primary importance of these species to anglers and commercial fishermen. Other popular species as the fluke, striped bass, porgies, sea bass, tuna, and swordfish were given such study as 1 year's observations would permit. Fortunately, the information given by the 1938 survey is supplemented by results of similar study made by the Bureau during the past 10 years. Consequently, for some species, more definite conclusions could be drawn than otherwise would have been possible. Definite recommendations for the conservation of several species and for additional study of other species have been included in the report to be published by the New York Conservation Department.

*Scup.*—This species appears to be successfully withstanding the year-around activity of fishing which has resulted from the rise of the winter trawl fishery beginning about 1930, supplementing the summer fishery which has been operating on a large scale throughout the Middle Atlantic States since about 1900. Major fluctuations in the catch of scup have resulted more from variations in the success of reproduction than from fishing activities. A major increase in abundance occurred throughout the Middle Atlantic States beginning in 1929 and has continued in most of the subsequent years to date. This increase has been due largely to a series of successful spawning seasons beginning in 1927. Some waste of the supply is occurring because of prevailing fishing practices which permit the destruction of undersized and unmarketable sizes of fish. Correction of this abuse is dificult because the species is caught simultaneously with a variety of other fishes and by several different types of gear. Saving of scup by appropriate modifications of gear to insure the release of a large percentage of the small fish in good condition would probably involve a loss by gilling or escapement of marketable sizes of other kinds of fish of equal or greater value.

Progress on the report dealing with the causes of fluctuations in abundance of this species during the past years along the Middle Atlantic coast has been temporarily interrupted by Mr. Neville's assignment to the Long Island Survey. It is expected that this report will be completed during 1939.

*Winter trawl fishery.*—The year 1938 marked the seventh anniversary of the commencement of the winter trawl fishery off the Virginia Capes. Beginning about 1931, the fishery has expanded rapidly. The total catch of the principal fishes—namely, sea bass, fluke, porgies, and croakers—has risen from approximately 4,500,000 pounds in 1931 to over 19,000,000 pounds in the past few winters. The fleet has increased from approximately 30 vessels in 1931 to over 125 vessels in 1938 and includes, in addition to local vessels, boats from New Jersey, New York, and Massachusetts. Landings are made mostly in Virginia and, to a lesser extent, in New Jersey and New York City.

The economic importance of this winter trawl fishery has increased since its beginning in 1931 through the creation of new market outlets for its production, particularly in the Southern States. This activity has also affected the distribution of numerous fishery products and introduced keen market competition with other distributing and production points, particularly in the Middle Atlantic States.

The activity of the winter trawl fishery is of biological significance in the probable effect it may have on the supply of those species that comprise its catch. To date there is no evidence that the winter fishery has caused any significant decline in the supply of scup. A reasonable doubt, however, exists as to whether the sea bass and fluke can withstand successfully the combined withdrawal of the winter and summer fisheries. Continued decreases in the catch per unit of effort for both species in most of the recent years and a similar reported decline in the summer fishery indicates a diminishing supply, probably from actual decreases in abundance. It is recognized that the winter trawl fishery may not be wholly responsible for this diminution in the catch but that the activity of the sport and commercial summer fisheries may also be contributing to the reported decline. A detailed study of fluke and sea bass, based on observations of the summer and winter fisheries, is therefore recommended to determine the cause of this decline and what corrections for restoring higher levels of abundance are necessary.

## ANADROMOUS FISHES

*Striped bass.*—In 1938 two important reports dealing with the life history and conservation needs of this species were submitted for publication. Dr. Vadim D. Vladykov submitted to the Maryland Conservation Department a report on his investigation in Chesapeake Bay in 1936 and 1937, and Dr. Daniel Merriman submitted to the Bureau his report on studies begun in 1936 under the auspices of the Connecticut Board of Fisheries and Game, and continued in 1937 and 1938 with the cooperation of the Bureau and several Atlantic Coast States.

The following are the principal results of these studies: The striped bass is subject to year-class dominance. When successful spawning occurs, as it did in 1934 in Chesapeake Bay, not only are local stocks greatly augmented, but, as a result of migration, abundance is greatly increased along the coast from New Jersey to southern New England, and even in the Gulf of Maine. Since the large brood of 1934 was produced in a year when spawning adults were scarce, it is doubtful whether increased numbers of spawners should be the primary object of conservation measures. Catch records and studies of age composition of the catch indicate that the numbers of such successful broods diminish rapidly. For example, the 1934 year class yielded only about one-fourth as many fish in 1937 as in 1936. Tagging experiments indicated that the fishery accounts for most of the decline. Protection of striped bass until they reach a length of at least 16 inches, measured to the fork of the tail (approximately 17½ inches over all), would lead to greater yields and larger profits from each brood, whether large or small. The number of fish reaching spawning size would also be increased.

*Shad.*—In marked contrast to the striped bass, the principal problem in shad conservation is maintenance of an adequate spawning reserve. Although pollution and obstruction of rivers have doubtless contributed to failure of reproduction, the decline in yield of more than 80 percent during the present century has not been limited to polluted or obstructed streams. On the contrary, some almost unpolluted rivers, such as the Edisto River in South Carolina, have been severely depleted and a fine recovery has been observed in the polluted Hudson River. This recovery is attributed to regulations limiting fishing to 4 nights a week and closing spawning areas to fishing.

In order to extend to other localities the benefits of the experience in the Hudson it is necessary to know the approximate spawning escapement there and to devise means of matching it substantially elsewhere.

Studies in 1938 indicate that the fishery removed somewhat more than 50 percent of the run. Of 196 shad tagged in Sandy Hook Bay in April, 53 percent were taken during the season in the river. Since tagging experiments usually underestimate fishing intensity it is probable that the fishery removed somewhat more than the indicated percentage.

As a check on the estimate of fishing mortality by tagging experiments, scales were examined for spawning marks in 1938 to estimate the percentage of that year's catch contributed by fish which had escaped the fishery in 1937. On the basis of the reported catch in 1937, and assuming a fishing mortality of 60 percent, approximately 1,667,000 fish should have entered the river in 1937. Of these, about 1,000,000 were caught and 667,000 escaped. Assuming 10 percent mortality among these after they left the river, about 600,000 would be expected to return in 1938. From preliminary estimates of the catch in 1938 it appears that the total run to the river was about 1,250,000 fish. Of these about 600,000, or 48 percent, would be "repeaters" or fish which had escaped the fishery and which had spawned in 1937. Forty-six percent of the scales collected in 1938 bore spawning marks indicating that they had spawned in 1937, certainly in very good agreement with the expectation from the above estimate.

Similar collections of scales have been made in other rivers where depletion is greater. As might be expected, the percentage of scales having spawning marks is much lower, but, until records of the catch for 1937 and 1938 are available, the percentage escapement in 1937 cannot be estimated.

Because of the importance of reproduction in shad conservation a careful ecological study of the early life history is being made by John C. Pearson and Louella Cable. In 1938 intensive work was done in the Edisto River in South Carolina and it is expected that these studies will be extended to other rivers in 1939. In these studies especial attention is being paid to estimating rates of mortality at various stages in the early life history, at various levels of abundance of young, and under various conditions of temperature and volume of river flow. For example, in 1938 most of the eggs taken in the plankton were dead. This may merely represent oversampling of the surface levels, for all plankton collections were made by surface nets. Further observations will be made in 1939 using bottom nets.

Such observations are expected to be of great value in estimating the optimum spawning escapement and also as a basis for estimating the most suitable size for releasing young shad produced in hatcheries.

Mr. Pearson conducted experiments in rearing shad fry in bass ponds at the Edenton, N. C., and the Orangeburg, S. C., Hatcheries. At the former station 6,500 young shad grew to a mean length of 35 mm. (1⅜ inches) in 35 days in April and early May. The pond was drained and an attempt made to rear a second lot in the same pond. Only 500 fish survived. It is not known whether this was the result of diminished food production during the summer or to the activities of predators accidentally introduced.

As a working hypothesis for the shad investigation, it has been assumed that the majority of the shad return to the river in which they were spawned. The correctness of this assumption is being tested from several angles. The tagging experiments which were intended primarily to measure fishing intensity will also indicate whether adult shad seek the same river each time they spawn. (Five shad have been recaptured, after a lapse of a year, in the same river or in estuaries en route.) Vertebral counts of adult shad are being compared with those of juveniles taken in connection with the early life history studies. The scales of adult shad from each of several rivers are being compared with those of young shad. Marked differences have been noted in the size and appearance of the stream-growth portion of the scales from different rivers, but until data from other years are available it cannot be determined whether these differences are characteristic of each year's brood in the individual streams. Attempts to tag juveniles have been unsuccessful thus far, but further experiments are planned.

## SHRIMP INVESTIGATIONS

Milton J. Lindner, *in charge*

With an annual catch averaging well over 100,000,000 pounds, the shrimp fishery is the most important marine food resource of the South Atlantic and Gulf States. The Shrimp Investigations are designed to provide a thorough knowledge of the life history, migrations, ecological relationships, and abundance of this first-ranking marine organism of the Southern States as a basis for its intelligent conservation.

All the members of the scientific staff which, in addition to Mr. Lindner, includes William W. Anderson and C. Howard Baltzo, have been associated at different times during the year with each of the various field investigations undertaken. In addition to the Bureau employees, Albert Collier, Marine Biologist of the Texas Game, Fish, and Oyster Commission, has been actively engaged in conducting a cooperative research program in Texas under the general direction of Mr. Lindner. The Louisiana Department of Conservation has continued to furnish office and laboratory space in New Orleans for the headquarters of the investigation. In October, Commissioner Rankin, of the Louisiana Department of Conservation, kindly arranged to supply more spacious quarters for the staff and collections at 336 Chartres St., New Orleans, La. The city of Gulfport, Miss., has continued to furnish dockage space for the *Pelican* and a storage room for equipment. Arrangements have been made with Dr. A. E. Parr, of Yale University, for analyses of the water samples, and with Dr. Dana Russell, of Louisiana State University, for analyses of the bottom core and mud samples taken during the cruises of the *Pelican*.

In the course of the shrimp investigations, which have been under way since 1931, it has been found that the common shrimp spawns during the spring and summer in the open waters of the Atlantic Ocean and the Gulf of Mexico. The eggs are not carried by the female but are extruded directly into the water. The young enter the inland waters at an early stage in their development. The extensive inland water areas of the South are the nursery grounds of the shrimp, where the young feed and grow. Those young not successful in reaching the nursery grounds perish. As the immature shrimp increase in size they gradually leave the nursery grounds and return to the ocean. The growth rate of the shrimp is quite rapid, and by mid-June or July, depending upon the locality, the young are of sufficient size to appear in the commercial fishery. By September, practically the entire catch is composed of these immature shrimp, for the adults disappear from the fishery as spawning progresses. Sexual maturity is attained in 1 year. The movements and behavior of the shrimp are affected by temperature, salinity, and tides.

Tagging experiments have demonstrated that shrimp are migratory. During the fall and winter the larger shrimp move south along the Atlantic coast from North Carolina, South Carolina, and Georgia into the waters off the coast of central Florida. In several instances tagged individuals have been picked up more than 300 miles from the place of release. The smaller shrimp, however, tend to remain in local waters and are not subject to such extensive movements.

In the Gulf of Mexico it was suspected that the larger shrimp, from the Louisiana coast at least, move off into deeper waters during the winter. With a suitable vessel and the proper equipment it was considered highly probable that a new winter fishery could be developed off the Louisiana coast. The *Pelican* was transferred to the Shrimp Investigations in 1937 for this purpose, but, owing to lack of funds, operation of the boat was deferred until January 1938.

The major program of work undertaken during the year falls into three general categories, namely: Offshore scouting operations with the *Pelican* in the Gulf of Mexico, tagging experiments along the Atlantic coast and the Louisiana coast, and ecological studies in Texas.

### OFFSHORE OPERATIONS

Among the results of the 1938 investigations, the event of outstanding importance to the commercial fishery was the discovery of a winter concentration area for large shrimp off the central Louisiana coast. The *Pelican* began operations in January and operated continuously until June, when the loss of the trawling cable necessitated a lay-up of 1 month for replacement. The boat was again placed in operation in July, but was laid up for engine repairs and for the duration of the dangerous hurricane season from August through October. Operations were resumed for a short period in November.

The offshore area from Mobile, Ala., 60 miles north of Brownsville, Tex., was covered with the *Pelican*. In this region 402 trawl hauls were taken and 96 hydrographic stations were occupied. From each haul observations were made on the quantity, sex, length, and gonad development of the shrimp. At the hydrographic stations temperature and salinity observations were secured for various depths, and core-tube and Petersen grab samples were obtained for study of the types of bottom and organisms present. Trawling was done in depths up to 180 fathoms. It developed during the course of the work that a small 9-foot trawl, towed at full speed, was admirably suited for scouting. As much as 8 gallons of shrimp have been taken with this gear in a half-hour haul.

That a winter concentration point for the larger common shrimp occurs off the Louisiana coast, in the region between Ship Shoal Buoy and Trinity Shoal Buoy, is quite evident from the data collected with the *Pelican*. As a result of the discovery of this area by the Bureau, boats operating from Morgan City, La., initiated a commercial fishery based on this offshore group of shrimp. A number of the Florida shrimp boats, which are better suited for offshore operations than the smaller and less seaworthy Louisiana craft, have migrated to Morgan City and Berwick, La., and have developed this fishery to one of considerable magnitude.

No shrimp concentrations of any significant size were found between the Alabama coast and the mouth of the Mississippi River. Off Texas during April the common shrimp appeared to be scattered about the 10-fathom contour, but with no evident heavy aggregations. The less-abundant grooved shrimp was found in depths up to 70 fathoms but no commercial concentrations were encountered.

Inasmuch as a considerable amount of offshore work remains to be done in the Gulf, it is planned to continue these operations during 1939. The region between Mobile, Ala., and St. Marks, Fla., should be covered to determine the depth distribution of shrimp in this area and whether or not commercial concentrations occur. The Texas coast should be scouted as far south as the Mexican border during midwinter. The fishing grounds between Ship and Trinity Shoals should be covered at regular intervals during the spring, summer, and early fall to determine: (1) The extent and duration of the apparent onshore movement of the common shrimp during spring and early summer; (2) the fate of the adult spawning shrimp as the season progresses; (3) the magnitude of and the period covered by spawning; and (4) the time that the young shrimp begin to appear in this area after leaving the bays.

### TAGGING EXPERIMENTS

For several years tagging experiments designed to provide information on migrations, growth rate, fishing intensity, and fate of the adult shrimp have been in progress throughout the South Atlantic shrimp fishing areas. Understanding of the fishery in this section depends largely upon the solution of these problems.

Previous tagging had established the fact that the larger shrimp move south along the coast during winter, concentrating in the waters between St. Augustine and Cape Canaveral, Fla. Indications of a return northward movement had been obtained from length-frequency distributions and prior tagging. Conclusive evidence, however, of this return movement had not been secured.

During 1938, 3,160 tagged shrimp were released from Cape Canaveral to St. Augustine in January, February, and March, a period representing the height and decline of the Florida winter fishery. From releases at Cape Canaveral returns were secured as far north as Fripp Island, S. C., a distance of some 250 miles. It is therefore evident that a return movement does occur. Whether this return movement is made at random or represents the return of shrimp to the region where they originated has not yet been determined.

Although the larger shrimp migrate to the southward during the winter, the small individuals remain in the local waters of Georgia. In January, February, and early March, 1,325 shrimp from this group were tagged and released in the area around Brunswick, Ga., in an effort to determine whether they also are migratory. The returns indicate that this class does not undertake any extensive movements. Additional tagging experiments in various areas along the entire coast would add materially to our knowledge of this group of so-called "local shrimp."

From April through August 3,200 tagged shrimp were released in the vicinity of Brunswick. The returns from these releases indicate that no extensive coastwise migrations were occurring at this season.

Because of the extensive and continuous migrations and movements of the shrimp, growth determinations by length-frequency distributions cannot be relied upon to present a true picture of the rate of growth over any considerable period of time. Neither can study of growth of confined individuals represent the true growth rate, owning to the extreme difficulty or impossibility of duplicating the widely varied changes in habitat that the shrimp undergo as they increase in size. Tagging experiments, therefore, provide the best source of information on the growth of the shrimp in its natural environment, as each shrimp is measured at release and upon recapture. Although many data have been accumulated, more tagging is required to arrive at an accurate approximation of the growth rate of shrimp during the different seasons of the year, and in different localities.

The determination of fishing intensity has long been a difficult problem. Although the percentage of returns from tagging experiments gives some indication of fishing intensity, detailed and accurate catch statistics are also necessary. None of the States in the area covered by the shrimp fishery has gathered catch statistics in a form suitable for analysis of the shrimp population density, a situation which is particularly deplorable in view of the magnitude of the fishery. Because of the lack of funds, personnel, and regulatory authority, it has been impossible for the shrimp staff to secure the necessary statistics. A serious effort was made during the year to secure voluntary cooperation of the fishermen in keeping daily catch records. Log books were provided to all boat captains willing to maintain them. Results indicate that a venture of this nature can be successful only through frequent personal contacts with the men keeping the logs. One shrimp cannery in Georgia kindly allowed the transcription of its entire boat catch records from 1921 to 1937. These records, which were copied in 1938, should be of considerable value in tracing the progress of the central Georgia shrimp fishery during its period of most rapid development.

It is quite evident from the work done so far that if adult shrimp survive for 2 or more years in any quantities along the Atlantic coast, they must move into deeper offshore areas beyond the range of the present commercial fishery. This important information which is lacking in our knowledge of the life-history of the common shrimp can only be determined by thorough scouting of the offshore waters between Cape Hatteras and Cape Canaveral. Exact knowledge, which is not now available, of the depth distribution of the shrimp along the Atlantic coast during the spawning season is of particular importance in attempting to delimit the spawning areas. Tentative plans are being made for the use of the *Pelican* on the Atlantic coast after the completion of the Gulf survey.

The expansion of the offshore fishery in the Gulf has raised the important question of whether these shrimp are of local origin or whether they are migrants from other States. It was deemed advisable, because of the urgent need for knowledge of the movements of shrimp in the Gulf, to suspend activities at the Brunswick (Ga.) station in the fall and transfer *Launch 58* to New Orleans for tagging operations. The first of the Louisiana tagging experiments was inaugurated during December, when 2,300 shrimp were released between the Mississippi River and Ship Shoal. The objective of these experiments, which should be extended to cover the entire fishery, is to determine the migrations, growth, age, and fishing intensity of the Gulf shrimp. Tagging will be continued during the coming year as funds permit.

## ECOLOGICAL STUDIES

The Texas Investigation is operated on a cooperative basis with the Coastal Division of the Texas Game, Fish and Oyster Commission. With the transfer of Kenneth H. Mosher to the Pacific Pilchard Investigations, the sampling of the commercial catch at Aransas Pass was discontinued. Albert Collier, of the Texas Commission, has conducted studies during the year to determine the relationship between the environmental changes and the distribution of shrimp in Aransas Bay. What effects do temperature, salinity, tides, currents, and food have on the reactions of the shrimp in its natural habitat? What determines the time when young shrimp leave the shoaler nursery grounds for Aransas Bay and later for the Gulf? Why does the success of the commercial catch fluctuate so greatly from day to day? Can these fluctuations be determined in advance? Is there actually a definite distribution pattern of shrimp in Aransas Bay, as appears to be the case from the commercial catch, and if such a distribution is present what is the cause? These and many other problems require solution for a better understanding and wiser utilization of the shrimp supply.

Stations were established at various points in Aransas and Copano Bays. These stations were occupied at regular weekly intervals when the weather and availability of boats permitted. At each station trawl hauls were made for shrimp, and temperature and salinity observations were taken. In the fall Mr. Collier instituted a weekly survey of the shrimp distribution in Aransas Bay. Hauls of 5 minutes duration were made with a small trawl in closely spaced parallel lines across the bay. From this work it appears that the shrimp follow a rather well-defined path across Aransas Bay in their movements from the more interior nursery grounds to the Gulf. During the coming year efforts will be directed toward determining the fundamental reasons for this distribution.

## NORTH PACIFIC AND ALASKA FISHERY INVESTIGATIONS

Dr. F. A. Davidson, *in charge*

The North Pacific and Alaska Fishery Investigations, with headquarters in the Fisheries Biological Station at Seattle, Wash., are concerned chiefly with the maintenance and rehabilitation of the salmon and herring fisheries of Alaska and the salmon fisheries of Puget Sound and the Columbia River. All of the major investigations in progress in 1937 were continued in 1938 with the exception of the Puget Sound sockeye investigation, which was discontinued in March 1938. An investigation of the Bristol Bay fisheries was undertaken in July 1938.

### COLUMBIA RIVER SALMON FISHERIES

Investigations of the Columbia River salmon fisheries were continued during 1938 by J. A. Craig, A. J. Suomela, M. J. Hanavan, Z. E. Parkhurst, J. L. Wilding, W. M. Morton, and J. A. Coleman.

*Stream surveys.*—One of the factors contributing to the depletion of salmon runs in the Columbia River watershed is the fact that important spawning grounds have been rendered inaccessible or made unsuitable for migratory fishes by the construction of irrigation diversions and by other activities of man. With the primary purpose of classifying those areas which may be rehabilitated, and of discovering means of making them accessible to fishes, an extensive stream-survey program has been undertaken and is now well under way.

During the early part of the season these stream-survey activities were centered in the Willamette River system. In this area surveys were completed on the McKenzie River, the middle and coast forks of the Willamette and Long Tom Rivers, and the upper portions of the North and South Forks of the Santiam. The Clackamas River survey was partially completed. The McKenzie, Middle Willamette, and the Santiam Rivers are the most important spring chinook streams of the Willamette system.

The Payette River system in Idaho was surveyed during the month of August. In early years this river was one of the important salmon streams in Idaho. Chinook and blueback salmon and steelhead trout migrated to the headwaters of this river in large numbers.

Payette Lake, at the headwaters of the North Fork, is reported to have supported a run of blueback salmon. Dams without adequate fish protection are responsible to a great extent for the extinction of the salmon runs in this river. A dam constructed at Horseshoe Bend 30 years ago probably destroyed the blueback run which had entered Payette Lake, and limited the migration of chinooks and steelheads to the part of the river below this obstruction. In 1925 the Black Canyon Dam was constructed by the United States Reclamation Service. This dam is a complete barrier to all migratory fish, since no fish protection was provided. It is reported that there have been fewer salmon observed below the dam each year. The stream survey revealed that the amount of favorable spawning area in the Payette River system is great enough to provide facilities for a large run of fish, if access to the spawning grounds were provided.

Stream surveys were carried on in 258 miles of the Clearwater River, including the main river from the mouth to Kamiah Creek, Potlatch Creek, North Fork to Kelly Creek, Middle Fork, Sellway River to Meadow Creek, and the Lochsa to Fire Creek. Some 500 miles of this large river system remain to be examined.

Stream surveys were also started on the Klickitat River but only 38 miles had been surveyed when winter weather conditions forced the termination of the survey for the season.

A total of 1,177 miles of stream was surveyed during the season. Information obtained from these surveys was made available to various interested agencies.

*Salmon redds and spawning habits.*—An investigation was undertaken to study the spawning habits of spring and fall chinook, silver, and chum salmon as an aid in interpreting the results of the stream survey. The information gained as a result of this investigation is as follows: (1) The space required for each pair of spawning fish, (2) type of gravel selected, (3) depth of water preferred, and (4) temperature prevailing at the time of spawning. In addition, case histories of individual redds were recorded, including data on the longitudinal and horizontal measurements of the redds, the time of the male intervention, the deposition of the ova, and superimposition and succession of the redds. These studies were conducted in the Kalama, Ohanopecosh, Toutle, Grays, German, Abernathy, and Alochaman Rivers.

During the period of investigation information was obtained on 486 salmon redds in these rivers. The results of this study are now being analyzed and a report for publication will be submitted in the near future.

*Tagging.*—A series of 25 tagging experiments were conducted in the Columbia River on spring and fall chinooks which pass through the fishery from May 1 to the latter part of August and early September. The purpose of these experiments is to obtain data on (1) the rate of migration of the salmon upstream, (2) their distribution in the river system, (3) their appearance at hatcheries, and (4) some estimate of fishing mortality. These experiments will contribute invaluable information as a basis for regulation of the fishery and for stocking policies.

The experiments were carried out at three localities on the river, Sand Island, Woody Island, and in the vicinity of Oak Point. These points are located 5, 25, and 45 miles, respectively, from the mouth of the Columbia.

During these operations 2,357 chinooks were tagged and liberated, of which 743, or 31.5 percent, were recovered from the commercial fishery, sport fishery, hatchery, and from the spawning grounds. The recovery from hatcheries was 48 tags, or 2.04 percent.

Information was obtained on the distribution of the spring chinook run in the tributaries of the Columbia, indicating that fish entering the river in the month of May are destined for tributaries in the Upper Columbia, Snake River, and Willamette River systems.

The results of this experiment will be included in a report which is being prepared for publication.

*Construction of fish protective works.*—On the 1st of July combination grants of P. W. A. and W. P. A. funds were made available for the construction of fish screens and other fish-protection works on certain Federal power and irrigation projects. These allotments authorized the expenditure of $50,000 in each of the States of Oregon, Washington, and Idaho, and $118,000 for the construction of one fish screen in the Wapato Canal of the United States Indian Service near Yakima, Wash., and one screen in the power canal of the United States Reclamation Service near Prosser, Wash. Surveys have been made and plans drawn for screens at the Wapato Canal, Prosser Canal, and Black Canyon Dam diversion of the Reclamation Service in Idaho, remodeling of screens in the Sunnyside Canal near Yakima, Wash., and construction of a screen in the Echo Feed Canal of the Reclamation Service on the Umatilla River in Oregon, as well as for several small projects in the State of Washington. Contracts have been let and work started on the construction of the steel screen drums for the above-mentioned projects. A contract has been made and work is well advanced on the concrete structure for the Wapato Canal screens. Excavation work has been going forward at the Black Canyon Dam site and at the Sunnyside Canal and considerable concrete and steel work has been done as well at Sunnyside. Concrete structures will be built at the remaining sites when the work can be done at the lowest cost and with the least interference with canal operations. This work has been done under the supervision of J. A. Craig and O. W. Lindgren, associate hydraulic engineer.

*Special surveys.*—An observer was stationed at the dam across the Clearwater River at Lewiston, Idaho, from late spring until late fall to observe the condition of the runs of migratory fish passing that point. It was found that a significant run of steelhead trout still enters the stream, but that salmon are no longer numerous in that watershed. Lack of adequate fishways is apparently the reason for this condition and the owners of the dam have drawn plans for two new fishways and the remodeling of the present single structure. As soon as this construction is completed, several hundred miles of spawning grounds will be made available again to salmon. Collection and tabulation of statistical data relating to catch records and abundance of salmon and steelheads of the river were continued.

### COHO SALMON

The coho salmon investigation, the basic objectives of which are a study of the life history of this species under the varying conditions found in the different streams of the Puget Sound region, the determination of the causes for the decline in its abundance, and the development of methods for rebuilding the runs was continued during the past year by George B. Kelez.

The series of three marking experiments undertaken during the fall and winter of 1937 at the Quilcene (Wash.) station of the Division of Fish Culture[2] was completed, during the month of May, with the marking of 17,094 coho fingerlings of the 1936 brood. These fish had been held for the purpose of releasing them at the approximate time of normal seaward migration. At the time of this last release, marked individuals from the lots released in September and December 1937 could still be observed in the Quilcene River in the vicinity of the hatchery. It is expected that comparative returns from these experiments will provide further information both on the success of various periods of hatchery rearing and on the relation of the additional costs of prolonged rearing to the increased survival rate of the fingerlings liberated.

No further recoveries of marked fish from the 1935 experiment on Voights Creek, tributary to the Puyallup River, were made during the late winter run, and none were taken from the Green River.[2]

Several tags from the 1937 Samish River experiment were returned to the laboratory during the spring and summer. This experiment was undertaken to test the practicability of marking fingerlings by the use of an internal celluloid tag in combination with the excision of the dorsal fin, as an alternative to the usual method of marking in which two or more fins are removed. If this method is successful, it will eliminate the present limitation on the number of possible experiments which the number of available fin combinations imposes.

Collections of scale samples and biological data from mature cohos taken in the commercial fishery were made during the season. Samples aggregating approximately 4,500 fish were taken during the summer fishery at Anacortes, Wash., and samples of more than 2,000 fish were taken during the fall fishery at Seattle. Supplementary samples and catch data were collected during the season from the sport fishery carried on in the vicinity of Seattle. Collections of coho fingerlings were also taken during the season from the sport fishery carried on in the vicinity of Seattle and the major streams tributary to Puget Sound.

During the spawning migration regular collections of scale samples were taken and estimates of population size were made on all streams tributary to Puget Sound on the eastern shore. It is believed that variations in early life history, as shown by the scale nucleii, will differ sufficiently between the colder northern streams and the warmer southern ones to afford a means of separating these populations on the basis of scale characteristics. Through a comparison of samples of scales taken from the commercial fishery with those from the two spawning areas, the relative contribution of these districts to the fishery may be determined.

Observations on the spawning grounds during the fall and early winter indicate that, although the total escapement of cohos was not large this year, spawners were well distributed in all the streams of the region.

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[2] See "Progress in Biological Inquiries, 1937."

## BRISTOL BAY SALMON FISHERIES

The Bristol Bay region of Alaska is the greatest red-salmon producing area in the world, providing, as it does, more than 60,000,000 pounds of first quality canned salmon a year. Sporadic studies of the salmon in this area have been carried on since 1922, and information has been obtained on the age and migration habits of some of the populations inhabiting the five major watersheds in this region.

The recent development of extensive offshore fishing has been considered a possible source of serious injury to this salmon fishery. The fact that there is little available knowledge of the life history of salmon in this area, and of the factors affecting the survival of the populations as a whole, made it imperative to inaugurate a thorough biological study of the fish of this region, their migration routes and the factors affecting their survival. An appropriation was made available on July 1 for the purpose of carrying on the first year's study of a 5-year program of investigation. The problems entailed in such an investigation are manifold and must necessarily include studies of a multitude of factors, biological, physical, and chemical, affecting the species from the time the eggs are deposited in the gravels in the upper reaches of the watersheds until the progeny from one year's spawning have completed their life cycle and have deposited the fertilized eggs from which another brood will result.

The investigation separates itself into two distinct though related divisions, the fresh-water and the marine, which are being carried on by George B. Kelez and J. T. Barnaby, respectively.

*Fresh-water studies.*—The principal activities of this phase of the investigation consist of the determination of the physical and biological characteristics of the fresh-water areas of the Bristol Bay region, the evaluation of the annual spawning populations, age analyses of the runs in the various rivers, and the measurement of factors influencing the mortality of the eggs and young fish in fresh water.

During the past season reconnaissance surveys of the five main river systems of the region were made, in which the general topographical features of the watersheds, the number and size of the headwater lakes and tributary streams, and the extent of the spawning areas were noted. From these observations thorough surveys of important spawning grounds have been planned and areas selected for carrying on marking experiments, migrant collections, and similar studies.

A number of small lakes, typical of the particular watersheds in which they lie, were inspected, and several suitable ones chosen for studies of the biological characteristics of the environment in which the young fish grow and develop. Here, also, the effect of varying climatic conditions on the survival of the stocks may be determined.

Methods of handling the commercial catch at the canneries were observed and plans were made for a complete annual program of random sampling of the catch in which scale samples will be taken for age analysis. Data on size, weight, and sex ratio will be obtained for population studies. These collections will be supplemented by similar sampling on the spawning grounds of each river system. From this material the age-group composition of each year's run, the total return from each season's spawning brood, and the selective effects of the commercial fishery may be determined.

*Marine studies.*—The sockeye salmon, after migrating seaward, spend 2 or 3 years in the ocean and then return to fresh water to spawn. During this period they make over 98 percent of their growth in weight. Hence, environmental factors affecting the fish during their stay in salt water have a most important part in determining the condition and quality of the mature fish.

The United States Coast Guard very generously cooperated with the investigation by furnishing one of their large cutters, the *Redwing*, for the purpose of conducting an oceanographic survey of the waters of Bristol Bay and the contiguous waters in which salmon live during their ocean sojourn.

The program of oceanographic studies followed the general methods used by Dr. T. G. Thompson, Director of the Oceanographic Laboratories at the University of Washington, who has been making oceanographic studies of the North Pacific Ocean for a number of years. In this way the data will be in proper form for comparison with the results of the general survey.

During the season the entire area of Bristol Bay proper, comprising over 10,000 square miles, was crossed and recrossed and samples were collected at 164 stations. The oxygen and salinity content of the water were determined and temperature data collected for the purpose of calculating the direction and force of the ocean currents. As a corollary to these studies current meters were operated at various depths and data were collected on the type of bottom and the depth of water at each station. Plankton samples were collected to determine the type and abundance of food present for the fish.

The oceanographic surveys are to be continued and the migration routes of the fish are to be determined by extensive marking, tagging, and sampling programs. These data will also furnish information on the fluctuations in ocean mortality.

### KARLUK RIVER RED SALMON

The investigation to determine the extent and causes of the fluctuations in the size of red salmon runs in Karluk River, Alaska, was continued in 1938 by J. T. Barnaby and Allan C. DeLacy. Field work was carried on from early April until the end of September.

*Population studies.*—The commercial catch of Karluk red salmon was sampled throughout the season to discover marked fish returning from marking experiments carried out in previous years. During the season 305,283 salmon were examined and 1,481 marked fish were found. The purpose of these experiments is to determine the mortality of the fish during their stay in the ocean. The results to date indicate that ocean mortality is fairly constant and that the variations in the ratio of return to escapement are mainly due to fluctuations in the environmental conditions affecting the fish during their stay in fresh water. The returns of marked fish during the past season were mainly from the experiments of 1936, in which year 26,700 fingerlings were marked by excision of the adipose and right ventral fins and 26,700 by excision of the adipose and both ventrals. Thus, in addition to the basic information desired, these experiments served as a check on the relative value of the different marks used. Recoveries of fish in which only one ventral had been removed amounted to 663, while recoveries of the fish in which both ventrals had been removed totaled only 569. Apparently the fish marked by removal of the adipose and both ventrals had a lower survival value than did the other group. While complete returns from this experiment will not be at hand until 1940 these results indicate that caution should be exercised in comparing marking experiments in which different combinations of fins have been removed.

A counting weir was again operated in the Karluk River to determine the number of fish going up the river to the spawning grounds. Counting was continued until September 3, at which time 875,678 red salmon and 1,639,589 pink salmon had passed upstream. Owing to the large number of dead spawned-out pink salmon drifting downstream the weir had to be removed on September 4. While the escapement figures are consequently not quite complete, they are of considerable value. Data on the escapements and the returns from given escapements have been collected for a number of years and it is important that no breaks should occur in the series of data.

More than 11,500 scale samples were collected during the season for the purpose of calculating the age group composition of the escapement and the commercial catch. The number of fish returning from each brood year is determined in this way and credited to the proper year. This study is of basic importance because it indicates what variations may be expected in the returns from known escapements and what is the optimum sized escapement for this and other watersheds of a similar magnitude and nature.

Ovaries from fish ranging in size from 20 to 24 inches were preserved and counts are being made to determine the number of eggs produced by each fish. The results of the present investigation will be compared with similar work done in 1926 to determine whether or not any change is taking place in the fecundity of the species.

The seaward migration of red salmon fingerlings began on May 26 and continued intermittently until June 16. For the purpose of determining the age composition and the length frequency of the various age groups making up the migration, samples were collected on all days the migrants were in the river. The migration appeared to be of average magnitude and the fingerlings were of the usual strong, sturdy stock so characteristic of this watershed.

*Predatory species.*—As the char *Salvelinus malma*, or Dolly Varden trout, is very abundant in the Karluk watershed and is considered to be one of the most important salmon predators, a study of this species is being carried on in conjunction with the studies of the salmon population. In 1937 a series of marking and tagging experiments were initiated to aid in determining the size, homogeneity, growth rate, migration habits, and mortality of the population of chars inhabiting the Karluk River and Karluk Lake. During the past year three more experiments were started, in which external tags were used in lieu of the internal tags used in the 1937 experiments. To recover the internal tags and discover the distinguishing number it was necessary to kill and dissect the fish. The external tag has a marked advantage in that a recaptured tagged fish can be identified by the number on the tag, measured, and then released. Recaptures of chars from these experiments are consequently expected to extend over several years, permitting accurate determination of growth and longevity of the species.

The results obtained from the 1937 and 1938 tagging experiments show that: (1) There is a slight amount of straying from one watershed to another but on the whole the chars return in the fall to the same streams from which they entered the ocean. (2) Many, if not all, of the chars that migrate seaward in the spring, return to fresh water in the fall of the same year and migrate seaward again in the spring of the following year. (3) There are at least two populations of chars in the Karluk watershed, those that live in Karluk Lake and those that live in the river. However, these populations mix to some extent. (4) The chars in Karluk Lake do not comprise a homogeneous population but are apparently divided into several rather distinct groups which intermingle to a slight degree. (5) The chars in this watershed have a relatively slow growth and are relatively long lived. (6) Sea-run chars make a faster growth during the time they are in the ocean than do the non-sea-run type during the same period of time. (7) Sea-run chars, on the average, make no growth in the 8- to 9-month period spent in fresh water between the upstream migration of one year and the downstream migration of the following year. Length-weight measurements made in the spring, and again in the fall, have shown that there is a marked difference in the condition factor of the downstream and upstream migrating chars. During the few months spent in the ocean these fish increase in weight from 60 to 100 percent, and about two-thirds of this weight increase is lost between the time of the upstream migration of one fall and the time of the downstream migration of the following spring. This loss in weight is attributable to the fact that these fish spawn during the period spent in fresh water and also in part to the limited food supply available during the winter months.

A cooperative observer's meteorological station was installed at Karluk in the latter part of June 1937. Data for the first fiscal year were complete by June 30, 1938. The collection of these data is of considerable importance in view of the marked effect climatic conditions have on the survival of salmon. The average monthly rainfall was 2.77 inches, the total for the fiscal year being 33.26 inches. There were 110 clear days and 255 cloudy or partly cloudy days. There was precipitation on 149 days. The highest air temperature during the year was 66° F. and the lowest was 6° F. The yearly mean average was 40.3° F.

### PINK SALMON

The pink-salmon investigation during 1938 dealt with the factors contributing to the change in abundance and the time of appearance of the pink-salmon runs in Southeastern Alaska. This investigation was carried on by Dr. F. A. Davidson and Samuel J. Hutchinson. The work was confined to a study of the pink-salmon runs in Southeastern Alaska which comprise the bulk of the Alaska pink-salmon catches. The total 1938 catch fell below previous yearly packs and, according to all indications, the runs are maintaining themselves with difficulty under the intensive commercial fishery. If the condition of the runs is not improved in the very near future, drastic measures will have to be taken to rehabilitate these salmon populations or they will soon fall to a dangerously low level of abundance.

Studies pertaining to the continuation and well-being of the pink-salmon runs in Alaska were conducted at the Biological Station in Seattle and the summer field station at Little Port Walter, Alaska. The field station was opened on June 21, 1938, and continued in operation until October 20, at which time the season's work was completed. A number of factors pertaining to the life history were investigated, and stream surveys and other types of aquatic biological studies were carried out.

A tagging experiment was conducted to determine the migration routes of pink salmon passing through Lower Chatham Strait, Alaska. Some 2,095 mature pink salmon taken from the commercial fish traps in Tebenkof Bay, Kuiu Island, were tagged and released. Of the total number tagged, 637 were recaptured by the commercial fishery, a return of 30.4 percent. The experiment is to be repeated in the summer of 1939 and when all recovered tags are collected, information will be at hand covering the routes of migration taken by both the even- and odd-year pink-salmon runs.

The salmon-counting weir was installed across the stream at Little Port Walter, and a sexing pen was constructed in front of the counting gate to determine the number of male and female salmon in the run. The first of the run passed through the weir on August 28. This was the latest date for the appearance of the run since the installation of a counting weir at Little Port Walter, the run being a full week after the latest observations previously recorded. The males entered the stream in greater abundance during the early part of the season, but by the close of the season the females had almost equaled their number. A total of 3,283 males and 3,184 females entered the stream, bringing the total to 6,467 salmon on September 22, the close of the season. Previous weir-count totals of salmon entering the stream at Little Port Walter have consisted of 6,952 pink salmon in 1934, 6,073 in 1935, 5,164 in 1936, and 7,085 in 1937. From these figures it would appear that the run has been able to maintain itself at a more or less fixed level of abundance in this locality during the past 5 years.

After the adult salmon had entered the stream to spawn, a series of gravel samples were taken from 28 nests of spawning fish to determine the size and type of rubble selected. In computing a percentage mean for each gravel size, and using all of the samples, it was found that 6.38 percent was 3-inch gravel or over; 5.79 percent was 2½-inch gravel; 8.38 percent was 2-inch; 10.80 percent was 1½-inch; 14.82 percent was 1-inch; 7.57 percent was ¾-inch; 12.75 percent was ½-inch; 8.76 percent was ¼-inch; and 24.76 percent was sand aggregate that passed through a ¼-inch screen. Nesting areas composed of gravel over 3 inches in diameter are not selected when areas of the finer aggregate are available, but, owing to crowded conditions, nest building and spawning sometimes take place in large rubble.

In February 1938, a C. C. C. camp was moved from Juneau, Alaska, to Little Port Walter, under the supervision of the Forest Service. C. C. C. personnel worked at the station all spring and summer clearing ground, building a dock and float, moving buildings to higher ground, constructing 3 miles of forest trail, and building two shelter cabins on the headwater lakes at Little Port Walter.

On July 22 and 24 the Forest Service, Bureau of Fisheries, and C. C. C. personnel cooperated on an experimental trout planting program through the use of aeroplanes. Rainbow trout averaging 10 inches in length were flown from Sashin Lake, back of Little Port Walter, to Blue Lake near Sitka. Other plantings were flown to a number of lakes south of Red Bluff on Baranof Island. The C. C. C. camp completed its program at Little Port Walter by the first of September and was moved to Port Alexander.

The cooperative observer's meteorological records were continued during 1938 at Little Port Walter. Through these records it is possible to measure the climatic changes that have a direct effect on the salmon's fresh-water environment. An anemometer and a psychrometer were installed as additional equipment to measure wind and humidity which indirectly play a part in the salmon's life cycle. A total of 264.53 inches of rain fell during 1938 at Little Port Walter, which is an average of 22.04 inches per month. Rain was recorded on 261 days. The highest air temperature was 71° F., and the lowest was 13° F., with a yearly mean average of 43.08° F. Fifty-five clear days, 58 partly cloudy, and 252 cloudy days were recorded at the station during 1938.

## ALASKA SALMON STATISTICS

Collection, tabulation, and analysis of the daily catch records from the various types of fishing gear operated by the salmon fishery in Alaska were continued in 1938 by Elizabeth Vaughan. All available catch records have been collected, and the files will be kept up to date in the future.

Analysis of these data consists mainly in determining average daily catches for each type of gear throughout each fishing season by districts. Indices of abundance and seasonal time of appearance of the salmon runs are determined from these daily averages. During the past year, the trap-catch records for 1937 in both Prince William Sound and Southeastern Alaska were analyzed and added to the previous compilations. This information, as in the past, was used as a basis for recommending changes in the fishing regulations in Alaska in order to provide for the conservation of the salmon resources. During the past year the gill-net records from the Bristol Bay area have been compiled for all years for which data are available.

From practically all parts of Alaska, fishermen and cannerymen have reported that pink salmon were very late in appearing during the 1938 season. It was felt that this phenomenon was unusual in all areas except Southeastern Alaska, where it was claimed the runs have been steadily getting later. Because of this belief, the industry demanded a revision of the fishing regulations. The statistics of the fishery, as collected and analyzed by this investigation, permitted an explanation of this phenomenon and a defense of the present regulations, which were embodied in a series of articles for publication in a commercial fishery journal.

The explanation of the change in the time of appearance of the Southeastern Alaska pink-salmon runs was made on the basis of the correlation between the abundance of the salmon, their average size, and the time of their appearance in the season.

### HERRING

Investigation of the herring fisheries of Alaska was continued in 1938 by E. H. Dahlgren. Mr. Kolloen, who was assigned as a permanent assistant in this work beginning in July, carried out the field work of catch-record collection and of obtaining data on the size and age composition of the populations in the Kodiak and Prince William Sound areas during the season.

Previous tagging experiments have established the fact that, while the herring populations of Southeastern Alaska are divided into a series of separate populations, there are certain areas, notably at Warren Channel and at the west coast of Kuiu Island, where two of the major populations intermingle on the feeding grounds. The electronic detector was operated to search the fish taken for frozen bait from the Sitka spawning area during the spring. Only two tags were recovered, owing to the decline in the age class which had supported the fishery for the previous 4 years. The younger fish, which were available to the bait fishermen this spring, had not been available for tagging during the previous seasons. Nevertheless, the recovery of these two tags, affixed in previous years at this spawning area, definitely established the fact that the herring return to the same grounds year after year to spawn.

A controlled tagging experiment was carried on at the station at Little Port Walter in order to determine the maximum size of tag which a herring may carry without causing undue mortality. If it is proven that a tag of considerably increased mass can be carried, the difficulty of recovery will be greatly reduced. After an initial heavy mortality the herring appear to survive with a minimum of loss. However, the mortality increases in direct ratio to size of tag, with the largest tag showing an 87 percent mortality as compared to 34 percent for the smallest and 20 percent for the controls at the end of a 2-month period. The experiment is being continued through the winter with the watchman maintaining the records.

The Southeastern fishery declined to an all-time low since its great expansion in 1927. Since that year the fishery has depended, in some seasons almost exclusively, on the population which spawns in the vicinity of Sitka and which migrates during the summer to Cape Ommaney to support that fishery, and to Warren Island and the west coast of Kuiu Island, where it mingles with the population which spawns at Craig. Studies of the age composition of this population show the almost total failure of three successive brood years; that of 1932, 1933, and 1934. These failures, together with a too intensive fishery, caused a decline of this stock to a dangerously low level.

The measure used in evaluating the abundance of this population is a comparison of the catch per unit of gear per day's fishing, with the average catch per day's fishing established over a 9-year period. In deriving these indices the fleet has been divided into two groups (those of over 35 net tons and those under this capacity) to minimize the difference in efficiency of the larger and smaller vessels. The index for the 1938 season for the large vessels was 35, as compared to 71 for 1937 and 140 for the optimum season of 1932. The indices for the smaller vessels were 41 for 1938 as compared to 75 for 1937 and 164 for the optimum 1932 season. On the basis of these findings, a closure of the Cape Ommaney area was recommended until the population shows definite signs of rehabilitation. The dangerously low level to which this population has been reduced was further evidenced by the failure of the normal number of spawners to appear at the Sitka area, which usually has had a large area heavily spawned.

The fishery in the Prince William Sound and Kodiak areas continues at a high level of abundance, as shown by continuing high yield and large catches per unit of gear. These areas are not yet as intensively fished as is Southeastern Alaska, but considerable expansion is contemplated in each area, and a close watch must be maintained to avoid over-exploitation and consequent depletion.

## PACIFIC PILCHARD INVESTIGATIONS

O. E. Sette, *in charge*

After 6 years of rapid and sustained increase in the total yield, the Pacific coast pilchard fishery experienced sharp fluctuations between 1937 and 1939. The season of 1937–38, for example, ended with a catch of 415,583 tons, which was 36 percent less than had been taken the previous year. In Washington and Oregon, on the other hand, though the summer season of 1938 was shorter than that of 1937, the total catch was greater than in any previous year, being 40,000 tons, or about 18 percent more than in 1937. Likewise, the fall season of 1938–39 in California was relatively successful, yielding by the end of 1938 a catch of 530,452 tons, which was 61 percent higher than that of the corresponding period of the previous year. Though other fluctuations had occurred during the relatively short history of the pilchard fishery, the sharp drop of last year's catch, following as it did an intensification of the fishery, caused concern among many as to the state of abundance of the pilchard stock. That there are fluctuations in the availability and even abundance of the stock, however, is one of the many elements that makes the problem of appraising the condition of the pilchard resource so elusive and complex.

This is a problem on which several organizations have been working for a number of years, namely, the fish commissions of California, Oregon, Washington, and British Columbia. In October 1937, the United States Bureau of Fisheries established a laboratory at Stanford University to cooperate with these agencies, to assist in the coordination of their results, and to investigate those features needed to supplement their findings. In May 1938, a conference of biologists, representing all the institutions working on pilchard research, was held at Stanford University. Past and current investigations were discussed and plans laid for future work.

Up to the end of 1937, a considerable body of information had been collected bearing on the migrations, spawning, age, and growth of the pilchard. Tagging experiments have demonstrated extensive migrations along the coast for as great a distance as between California and British Columbia. The spawning season has been determined in California, the principal spawning grounds surveyed, and the egg and larval stages described. The phenomenon of fluctuating year classes has been well established, individual dominant year classes having been recognized and traced through several years.

The basic problem remaining for solution is this: What is the optimum level of catch below which the stock would go to waste through underutilization, above which it would become reduced to commercial unimportance through overexploitation? Before this level can be determined, three questions must be solved: (1) How much is the stock reduced by the fishing? (2) How has the relation in the stock of income to outgo changed during the growth of the fishery? (3) How much does fishing in specific areas affect the stock in other areas?

Answering these questions necessitates the determination of abundance, age, reproductive success, and of the importance of intermigration. These necessities determined the program of the South Pacific Investigations during 1938.

## STUDIES OF ABUNDANCE

Since the conventional method of estimating abundance from the performance of fishing fleets is limited to the range of fishing operations, attempts were made to measure directly the size of the pilchard population by aerial observations. This work, done in planes of the United States Navy and Coast Guard from January to May, covered an aggregate of 13,000 miles of flying distance, extending from Cape San Quentin on the south to Santa Barbara on the north, and several hundred miles to sea, and covering the more important schooling grounds of the pilchard a number of times. Although schools were sighted frequently and identified as pilchards, it was found to be unfeasible to estimate their size because their limits could not be defined. Also, judging from the time and places of occurrence, it was concluded that they did not appear near the surface by day in proportion to their abundance. Night observations were even less satisfactory, and the aerial method had to be abandoned.

Consequently, a measurement of changes in relative abundance by an analysis of the commercial catch, begun in 1937, took on added importance. The catches of boats delivering pilchards to the floating reduction plants, operating off San Francisco since 1931, were made available for this purpose by the plant owners; and the shore landings of the fleet considered were furnished by the California State Fisheries Laboratory.

Obviously, the boat catches alone are not directly indicative of the availability or abundance of the fish, for the activities and success of fishing boats are modified by the weather, the number of hours of darkness, since pilchard fishing is carried on in California only in the dark, and by other less tangible influences. Consequently, it was necessary to treat the data statistically so as to account, as far as possible, for the effects of these influences. Transcription of the records was completed and the analysis was under way during 1938. It is anticipated that a report on this subject will be completed in 1939. The findings in relation to comparable work being carried on for the ports of Monterey and San Pedro by the California State Fisheries Laboratory, and for Oregon and Washington by the Fish Commission of Oregon, should answer question 1.

### AGE AND GROWTH

The second question can be answered by determining the ages of the fish making up the population each year, thus learning the relative abundance of the individual broods of previous years (income) and how fast they are removed by fishing and by natural mortality (outgo). To begin with, the relationship between age and size must be established. Once that is done, the findings can be applied to past records to detect any changes in the balance between income and outgo.

Age determination is being attempted by interpreting marks in hard structures, by observing the growth of young pilchards, and by identifying modes in frequency distributions of the adult population. During 1938, a series of frequency curves of young fish measured in southern California was collected, from which the growth rates of the first two or three age classes may be traced. A sample of young was also collected for comparative purposes at Magdalena Bay, Lower California, and others from Coos Bay, Oreg., and from various points in Washington.

Scales and otoliths were collected through the year from the young fish samples. Most of these, numbering over 10,000, have already been mounted by a W. P. A. project, and they are now being studied to learn the time of appearance of a year-mark and the extent to which pilchard scales can be used for age determination. During 1938, sampling of young fish was carried on at San Pedro, Newport Beach, and San Diego. This work will be continued in 1939 so as to complete at least one year's cycle of growth.

For studies on various phases of the biology of the commercial-sized fish, the South Pacific staff sampled the catch at Grays Harbor during the summer at Washington, and during the subsequent fall and winter at San Francisco. In addition to age and growth studies by analysis of the frequency curves, these data will be examined to determine the extent to which the populations of the two regions can be identified with each other. The work will be much facilitated by comparable samples from Oregon, taken by the Oregon Fish Commission.

A history of the size composition of the pilchard population in California, going back almost to the beginning of the fishery, has been kept by the California State Fisheries Laboratory, whose staff has sampled the catch systematically since 1919. Thus is recorded the rise, growth, and decline of the various dominant year classes that have appeared since then. This vast amount of data is being made available to the South Pacific Investigations for use in connection with current studies. During the year part of these records have been transcribed to a punch-card sort system. Through the aid of a W. P. A. project, it is expected that the remainder of the transcription will be completed during 1939. The records will be treated statistically in an effort to recognize homologous component age groups, to measure the rate of their removal, and hence to compare the effect of the lower fishing intensities of former years with higher current intensities.

## EARLY LIFE HISTORY

The study of the data on size composition has already shown a relation between temperature and incoming successful year classes, warm years being associated with their appearance in the fishery 3 years later, cold years with their nonappearance. A report on this subject was prepared during 1938 for publication.

Further investigation of the relation between temperature, or other environmental elements, and successful year classes should make it possible to predict 3 years in advance the relative size of year classes, and hence facilitate greatly an intelligent management of the fishery from the conservation as well as industrial viewpoint.

Such knowledge requires a boat for the quantitative sampling of the young during their stages of random distribution, and for the study of conditions on the actual spawning and nursery grounds. For 1939, arrangements have been made with the Scripps Institution of Oceanography for a joint expedition on the research boat *E. W. Scripps* during May and June off the coast from California to British Columbia. The northern and western limits of the spawning range of the pilchard will be sought by the Bureau. Parallel observations on the hydrographic conditions will be made by Scripps Institution. This first cruise must of necessity be of a preliminary nature, and can be of far-reaching significance only when related to cruises made in other years and covering the entire pilchard-spawning season. It seems unlikely that such a program of marine work can be carried out unless a boat is at the year-round disposal of the investigation.

## ORIGIN OF THE COMMERCIAL SUPPLY

To determine whether the stock in northern waters is self-perpetuating, young pilchards were sought along the Washington and Oregon coasts during the year. The stomachs of salmon and albacore, both predaceous, which presumably feed to some extent on pilchards, were examined at frequent intervals between March and December. In this manner young fish were found in April and, later, additional ones were collected by a beach seine in Willapa Bay, and others in a trap at Coos Bay. Though these collections may indicate some spawning in northern waters, the importance of such spawning in perpetuating the population found there is yet to be investigated.

It is hoped to appraise the contributions from various spawning areas through study of the sculpturing on the scales. Preliminary examination has shown that the spacing of the ridges on scales appears to differ among young fish caught in different localities. If further work confirms preliminary observations, this would be a characteristic established early and preserved throughout life. It would constitute, in effect, a marking on the fish according to areas of origin, and suitable interpretation of it would provide an answer to question 3. This will require additional collections of young fish during 1939 in various localities from Mexico to British Columbia. The studies on the scales will be continued so as to determine the significance and utility of ridge measurements and age determinations.

The program of work was carried out by a staff consisting of O. E. Sette, in charge of the investigations, Dr. L. A. Walford, Kenneth Mosher, Ralph Silliman, and Earl Palmer. The prosecution of these investigations over so large an area was made possible by the cooperation and assistance of several organizations and persons. Stanford University contributed spacious laboratories for the central office, and extended the privileges of the University to staff members. The California Institute of Technology provided space for the southern field station at its marine laboratory in Corona del Mar. The California State Fisheries Laboratory furnished records essential to various phases of the work. Various branches of the Government service gave much valuable cooperation during the year. The aerial observations were carried on in planes of the United States Navy and Coast Guard. Space was provided a member of the Bureau on board the United States Coast Guard Cutter *Hermes* for experimental work on collecting apparatus at sea and for a cruise to Magdalena Bay, where samples of young fish were obtained. Also, the Coast Guard, as well as the United States Weather Bureau, furnished weather data for points along the Pacific coast. During the year the staff enjoyed the advice of members of these organizations, particularly of Drs. Frank W. Weymouth, Willis H. Rich, and Hugh H. Skilling of Stanford University, and Lt. Comdr. C. W. Thomas and Lts. S. C. Linholm and W. E. Sinton of the United States Coast Guard. The extensive sampling of the catch was made possible by the willing cooperation of members of the fishing industry from San Diego to Seattle.

## GREAT LAKES FISHERY INVESTIGATIONS

DR. JOHN VAN OOSTEN, *in charge*

The critical depletion of the more valuable commercial species continues to be the major problem of the Great Lakes fisheries. The extent of this depletion is apparent from comparison of the present-day production of certain species with that of earlier years. As an illustration, if normal production in Lake Michigan is given an index value of 100, the present productions of important species are as follows: Wall-eyed pike, 62; lake herring, 59; lake trout, 58; whitefish, 58; yellow perch, 43. Similarly, the production indexes of perch and chubs in Lake Huron are only 44 and 36, respectively, and the production of the renowned Lake Superior whitefish is only 10 percent of normal. The preceding examples are only representative; in Lake Erie the production of nearly all important commercial species is without question on the decline, and the present total production of Lake Ontario is only 20 percent of normal.

The downward trend in the production and abundance of important commercial species of the Great Lakes has by no means reached its limit, except, of course, for such forms as the sturgeon, the Lake Ontario bloater, the blackfin of Lakes Michigan and Huron, the bluefin and longjaw of Lake Superior, and the Lake Erie cisco, all of which have become commercially unimportant. With most species, present conditions represent only a stage in a process of depletion that will certainly lead to the complete ruin of the fishery unless immediate and drastic measures are taken to halt present abuses.

As proof of the contention that depletion is even now proceeding rapidly, it may be pointed out that trout fishermen of Lake Superior have found it most difficult to operate at a profit during the past 2 seasons; that the production of whitefish in Lake Michigan dropped to an all-time low in 1936 and failed to show significant improvement in 1937; that the production of chubs in the State of Michigan waters of Lake Michigan decreased more than 40 percent from 1935 to 1937; that the 1937 production of whitefish in Lake Huron was only 1,120,000 pounds as compared to a 1930–34 average of 3,394,000 pounds; and, finally, that the production of yellow perch in Lake Erie decreased from 14,219,000 pounds in 1934 to 2,051,000 pounds in 1936. It is true that the production of some species has at times shown temporary improvement, but these increases have merely constituted irregularities in the general downward trend.

Decades of bitter experience have demonstrated conclusively that the depletion of Great Lakes fishes cannot be halted under the present system of divided control, in which each State frames its own laws for the regulation of the fisheries within its boundaries.

The possibility that adequate and uniform regulations for Great Lakes fisheries will ultimately be attained was increased greatly in 1938 by the active support of two influential organizations, the Council of State Governments and the National Resources Committee. At a Great Lakes Fisheries Conference called by the Council at Detroit February 25–26, 1938, a resolution was adopted recommending the establishment, by treaty with Canada, of an International Board of Inquiry into conditions of the Great Lakes fisheries. A Special Committee on Lake Michigan Fisheries was organized and held its first meeting at the time of the Great Lakes Conference. The Special Committee held a second meeting in Chicago on May 6.

Both the Great Lakes Committee and the Special Committee on Lake Michigan Fisheries held meetings in the late autumn in Chicago, at which time they reviewed progress made during the year and elaborated their program for coordinated action by Canadian, Federal, and State agencies. As an immediate goal both committees will attempt to secure the enactment of discretionary power acts whereby the conservation departments of the several Great Lakes States will be authorized to regulate Great Lakes Fisheries by executive order.

The appointment of Dr. Van Oosten in October 1938, to membership in the Water Resources Committees, of the National Resources Committee, of the Upper Great Lakes (Superior, Michigan, and Huron) and Lake Erie basins marked the first representation of Great Lake fisheries interests on these committees. Dr. Van Oosten was later made a member of a subcommittee of each of the basin committees on water as related to industry and navigation. The Upper Great Lakes and Lake Erie Basin Committees plan to cooperate fully with all agencies interested in the development of a sound conservation program for Great Lakes fisheries.

An executive order drawn up by the Wisconsin Conservation Commission and signed by the Governor on January 21, 1938, constituted an outstanding advance in the regulation of Great Lakes fisheries. The order contained provisions for substantial increases in the mesh size of commercial gear and in the size limits of lake trout and whitefish in the Lake Michigan waters of the State. These changes, which brought the Wisconsin regulations nearer the standards maintained by the State of Michigan, are an important step toward the attainment of uniform regulations for all Lake Michigan waters.

The activities of the Great Lakes staff were again characterized by active cooperation with State and Federal officials and with sport and commercial fishermen. Certain of the cooperative projects will be described later in this report. During the year Dr. Van Oosten acted in an advisory capacity at 19 meetings and conferences in which Great Lakes fisheries problems were under consideration. He also continued to assist State conservation officials in the drafting of proposed fisheries regulations.

The Bureau gratefully acknowledges the cooperation of the University of Michigan in providing laboratory space and extending numerous other courtesies to the staff.

## STUDIES OF ABUNDANCE

Dr. Ralph Hile has completed the routine computation of 1937 indexes of production, abundance, and fishing intensity for important commercial species in each of the 20 statistical districts of the State of Michigan waters of the Great Lakes. The assignment of a W. P. A. project to the Great Lakes laboratories has made possible the tabulation of valuable production statistics for the several fishing districts over the 18-year period, 1891–1908. These compilations are being made from original records loaned to the Bureau by the Michigan Department of Conservation.

## AGE AND GROWTH STUDIES

*Lake Huron whitefish.*—A study (in press) of the Lake Huron whitefish, *Coregonus clupeaformis*, by Dr. Van Oosten included information on growth rate, growth compensation, the age and year-class composition of the stock, the sex ratio, age at maturity, the relationship of total and standard length, the length-weight relationship, and the coefficient of condition. The Lake Huron whitefish grows most rapidly in the first year of life, but a secondary period of rapid growth occurs in the fourth year. Growth compensation occurs during at least the first 7 years of life. The collection of the summer of 1923 was dominated by age-group IV (1919-year class), and the fall collection of 1924 was dominated by age-group VI (1918-year class). The sexes were equally abundant in the collections as a whole, although the males tended to become relatively less numerous with increase in age. Sexual maturity was attained by nearly all males in the fifth year and by females in the seventh year. A single curve was found suitable to express the length-weight relationship of both males and females. There was, nevertheless, a noticeable tendency for females to be heavier than males of the same length, and for whitefish taken in the summer of 1923 to be in better condition than those collected in the fall of 1924.

*Lake Champlain whitefish.*—A paper entitled "The Age, Growth, and Food of the Whitefish of Lake Champlain" by Drs. Van Oosten and Deason is now in press. The materials consisted of scale samples and records of weights and measurements of 120 whitefish taken in northern Lake Champlain in 1930, and 175 individuals taken in southern Lake Champlain in 1931, and of the stomachs of 141 whitefish, also collected from southern Lake Champlain during the fall of 1931. The data suggested that the natural size and age composition of the Missisquoi Bay population was disturbed by the early fall seining of 1930. The size and age distribution of the southern Lake Champlain fish indicated that no disturbance through exploitation had taken place. The two populations were more or less distinct also as to growth rate, the length-weight relationship, and the location of spawning grounds. Autumn is apparently a season of reduced feeding activity, for 86 percent of the 141 stomachs examined were empty. The food consisted almost exclusively of invertebrates (99.1 percent) which were made up principally of mollusks (92.8 percent).

*Lake Erie yellow perch.*—Mr. Jobes has completed the preliminary draft of a manuscript on the growth of the Lake Erie perch. Much of the information obtained in this study has been presented in past reports. The most important new development was the determination of a method for the calculation of growth from scale measurements. Lengths at the end of the second and later years can be computed by direct proportion, that is, on the assumption that the body-scale ratio is constant. First-year lengths, however, must be determined from an empirical curve of the body-scale relationship.

### SPECIAL SURVEYS

*Red Lakes and the International Lakes.*—At the request of the Office of Indian Affairs of the Department of the Interior, Drs. Van Oosten and H. J. Deason conducted a 3-week survey of the fisheries of Upper and Lower Red Lakes in northern Minnesota during late August and early September 1938. The principal purpose of the investigation was to obtain information for the settlement of various controversies concerning the regulation of the commercial gill-net fishery that is conducted by the Indians on Lower Red Lake and by white citizens on Upper Red Lake. The survey included the quantitative analysis of commercial catches as to species and size composition, a study of the variations in the size of gill-net mesh employed, and the collection of biological data for the study of the life histories of the principal species. All available statistical records of the commercial fishery and of the artificial propagation of wall-eyed pike and whitefish were transcribed for later analysis. Conservation and Indian Agency officials, fishermen, and other interested persons were interviewed.

A large portion of the work preparatory to the submission of a formal report has been completed. The report will contain recommendations, largely for the guidance of officials of the Red Lake Indian Agency, for the regulation of the commercial fisheries which constitute one of the principal sources of income for the Indians.

Following the Red Lakes survey Dr. Van Oosten made a brief survey of the boundary waters of northern Minnesota and southwestern Ontario, at which time he interviewed fishermen, transcribed statistical records, and collected biological data on the principal commercial species.

*Potagannissing Bay investigation.*—The investigation of the relationship between the sport and commercial fisheries of Potagannissing Bay, Lake Huron, conducted under the joint supervision of Dr. Van Oosten and F. A. Westerman of the Michigan Department of Conservation, has been concluded and a formal report has been prepared. The allegedly harmful effect of the commercial trap-net fishery of the area on the population of game fishes, particularly smallmouth bass, in the region apparently has been overestimated. The occurrence of large numbers of bass in the trap nets is distinctly seasonal and confined to relatively limited areas. Consequently, only minor restrictions on the commercial fishery for coarse fish are necessary in order to afford adequate protection to the game-fish stock. The report contains specific recommendations for the regulation of the fisheries.

*Lake Champlain investigation.*—The report of the International Fact-Finding Commission, consisting of Dr. Van Oosten of the Bureau and of James A. Rodd of the Department of Marine and Fisheries, Ottawa, Ontario, on fisheries controversies on Lake Champlain was largely completed during the past year and will soon be submitted to the respective governments. The report will contain a discussion of the fisheries controversies, a tabulation and analysis of all available information concerning commercial fishing and angling, descriptions of the natural history of the principal species, a critical historical review of the artificial propagation of wall-eyed pike and yellow perch, and recommendations for the regulation of the commercial and sport fisheries of Lake Champlain. Appendices to the report will contain original studies of the feeding habits of the principal species as independent contributions of Dr. H. J. Deason and F. W. Jobes of the Bureau, and Dr. R. H. M'Gonigle of the Fisheries Research Board of Canada.

## SHELLFISH INVESTIGATIONS

### Dr. Paul S. Galtsoff, *in charge*

Although the difficulties experienced by the oyster industry in past years were greatly alleviated during 1938 by the general improvement of economic conditions in the country, the decreasing supply of good oysters continued to present a serious problem endangering the future progress of the industry. Scientific and technical knowledge concerning the oyster and its method of cultivation shows that this difficulty can be overcome by increased cultivation of oysters, improvement of the quality of oyster meat, and standardization of the raw and canned product offered to the consumer.

Practical application of this principle meets, however, with many legal and technical difficulties. In many States the introduction of oyster-cultural methods on a large scale necessitates the reorganization of existing policies and systems of operation and abandonment of the practice of exploiting natural oyster resources. Personnel capable of directing and supervising oyster-cultural activities is required to introduce systems of cultivation into States where exploitation of the public bottoms has been the traditional method of the oyster industry since its establishment. Inasmuch as the development of methods of oyster culture suited to the varying conditions of local waters depends upon scientific studies of the physiology and life history of the oyster, it is apparent that the accumulation and dissemination of such information among interested persons is of great practical importance to the oyster industry.

Studies on the propagation of the oyster, its cultivation on public and privately owned bottoms, and the protection of valuable fishing areas against the attacks of natural enemies and pollution have continued to be the principal fields of shellfish investigation conducted by the Bureau in Massachusetts, Connecticut, Virginia, North Carolina, South Carolina, and Florida.

To determine the practicability of various methods of oyster culture suggested by laboratory experiments, steps have been taken to establish experimental oyster beds in localities set aside for this purpose by State authorities. In cooperation with the South Carolina Board of Fisheries and the Works Progress Administration an experimental project of this nature was undertaken in South Carolina. Experiments on the control of starfish were conducted in Long Island Sound and studies of the parasites of the oyster were continued in Beaufort, N. C. The work on pulp-mill pollution in York River was continued with the cooperation of the Virginia Department of Fisheries with the view of determining the chemical nature of the substance present in the effluent which was shown by previous investigation to be harmful to oysters.

### PHYSIOLOGY OF THE OYSTER

*Propagation.*—Since successful propagation depends upon the presence on oyster beds of a large number of specimens of both sexes capable of spawning, the sex changes in the adult oyster present a problem of practical importance to the oyster farmer. Study of this problem was continued by Dr. Galtsoff and staff at the Woods Hole (Mass.) laboratory and at Milford, Conn., where experimental mollusks individually marked are kept in the outdoor tanks. During the first year (1937) 8.0 percent of the males changed to females and 13.1 percent of the females changed to males, total change in either direction being 9.7 percent. In the second year (1938) 11.2 percent of the males changed to females and 12.1 percent of the females became males, total percentage of changes in either direction being 11.5. Sex reversal among oysters that have already changed their sex occurs much more often. Out of the total of 32 oysters which changed their sex at any time between 1936 and 1938, 22 (69 percent) reversed their sex. The results suggest the presence in the population of a group of animals with unstable gonads.

Development of spawning reactions, which are different in the two sexes and are characterized in females by the rhythmicity of muscular contractions and discharge of eggs through the gills, fails sometimes to keep pace with gonadal changes and results in physiological intersexuality. Some of the sex-reversed males, possessing ripe ovaries, reacted in typically male fashion by discharging eggs through the cloaca. A complete female spawning reaction occurred, however, at the end of the reproductive season, at which time the intersexuality had disappeared.

*Survival and aging of eggs and sperm.*—Experiments on fertilizability of eggs and their survival in water after being discharged by the oyster were carried out at Woods Hole by Dr. Galtsoff. It has been found that more than 50 percent of the eggs will cleave if sperm is added after 12 hours, but a very small percentage cleave normally if 24 hours elapse between their discharge and insemination. The life of sperm depends to a certain extent upon its concentration in sea water. In sufficient concentration (0.2 g. in 50 ml. of sea water) good sperm is still effective after 24 hours. In greater dilution the sperm perishes sooner. These experiments indicate that simultaneous spawning of the majority of adult specimens and crowding of spawners on spawning beds are essential for the successful propagation of the oyster.

*Respiration.*—The study of oyster respiration was undertaken with the view of determining the effect of environmental conditions on this fundamental living process. An understanding of the factors controlling the uptake of oxygen by an aquatic mollusk is especially necessary for the study of its carbohydrate metabolism and of other metabolic processes which result in the accumulation of glycogen, heavy metals, calcium, and other elements which, from the nutritive point of view, are important food constituents of the oyster meat.

Using the metabolism chamber specially designed for this work and employing the technique perfected during the previous summer, Dr. Galtsoff and G. I. Mishtowt carried out a number of experiments studying the effect of lowered salinity and increased $CO_2$ tension on oxygen consumption. It has been found that in all the experiments with diluted sea water the oyster used an average of 13.6 percent more oxygen in a salinity of 24 parts per thousand than in a salinity of 32.

Experiments with $CO_2$ consisted in bubbling this gas through sea water and determining the rate of oxygen consumption. It was found that $CO_2$ has a depressive effect on oxygen consumption, which begins to decrease with the decrease of hydrogen ion concentration. The maximum effect is obtained at pH 6.0 or lower, the oyster under these conditions using practically no oxygen and presenting all the appearances of being narcotized.

Further plans for this investigation comprise the determination of respiratory quotients of oysters at different times of the year and under various environmental conditions, and a study of the effect of various pollutants on respiration.

## OYSTER CULTURAL STUDIES

*Propagation of oysters in Long Island Sound.*—The oyster industry of Long Island Sound and adjacent waters depends upon an abundant supply of seed oysters for its perpetuation. Since the rate of survival of Connecticut seed oysters transplanted to other waters is high, and their growth in a new environment is rapid, there is always an extensive demand for them, and seed producing has become a profitable industry of the State. However, owing to the frequent failure of oysters to set, the industry has not been in a position to supply the much needed seed oysters. In addition to the poor natural setting, the destruction of spat and seed oysters by various pests, especially starfish, is tremendous. The protection of young oysters from their enemies constitutes, therefore, another vital problem for the oystermen. Both problems have been under investigation by Dr. V. L. Loosanoff and James B. Engle at the Fisheries Laboratory at Milford, Conn.

*Spawning and setting.*—Continuing the investigations begun in 1937, spawning and setting of oysters were observed at a chain of 15 stations extending from Bridgeport to Morgan Point and east to New Haven, thus covering the most important part of the Connecticut seed-oyster producing section. The methods employed in this study were identical with those used the previous year.

Observations of the past 2 summers on the spawning of oysters in Long Island Sound indicate that, contrary to common belief, spawning may take place at temperatures several degrees lower than 20° C. (68.5° F.). The first spawning of oysters occurred on June 28, far in advance of the expected time and at a temperature of only 16.4° C. (62° F.). The highest temperature recorded on this day at any of our sampling stations, distributed over a distance of 30 miles of the oyster-producing section of the Sound, was 18.3° C. (66° F.). The average bottom-water temperature of all 15 stations was 17° C. (63° F.). To avoid any errors in recording the water temperature, measurements were taken simultaneously with four deep-sea reversing thermometers, their correctness was verified by the United States Bureau of Standards, and the temperature was read by two investigators.

These observations indicate the need for modifying previous methods for predicting the time of spawning which have been based upon the assumption that oysters do not spawn at a temperature below 20° C. It is evident that other factors, undetermined at present, are involved in inducing the spawning of oysters at low temperatures. Until these factors and their role in stimulating the shedding of sex cells is ascertained, no infallible method for predicting the spawning time of oysters living under natural conditions can be advanced.

Throughout the summer systematic observations on the setting of oyster larvae were made at some 37 stations located in different sections of the Connecticut oyster-growing area. In general the setting occurred late and was extremely light. During the course of these surveys information on the condition of oysters and the prospects of obtaining set was supplied to oystermen at regular intervals through a bulletin distributed by the Connecticut Shellfish Commission.

Observations on vertical distribution of oyster set in 1938 fully support conclusions reached during the previous year to the effect that in Milford Harbor setting occurs in the zone extending from the bottom to a point 2 or 3 feet above low-water mark. Above this level to high-water mark, a distance of about 4 or 5 feet, no setting occurs.

*Chemical control of starfish.*—A method for the control of starfish by chemical means was tested during the year in large-scale experiments in the Long Island Sound area. Early results of these field experiments and of previous laboratory tests indicate that important progress has been made toward effecting the control of the most important enemy of the oyster in the New England area.

Since mechanical control of starfish on oyster beds is expensive and only partially effective, the advantages of employing some toxic substance for the eradication of these pests have been obvious. Laboratory experiments on the use of calcium oxide, or quicklime, for the destruction of starfish were therefore initiated at the Milford Laboratory in 1937 by Dr. Loosanoff and Mr. Engle. During the spring and summer of 1938 the method was also tested under natural conditions on the oyster beds of Long Island Sound, where starfish are abundant.

In one test where 25 acres of starfish-infested oyster bottom were treated with calcium oxide at the rate of 480 pounds per acre, as many as 80 percent of the starfish were found to be affected by the chemical 1 week after the beginning of the experiment. In an area where 280 pounds of calcium oxide per acre were used, the chemical acted upon 74 percent of the starfish. It is believed that much better results will be achieved when a suitable mechanical method insuring uniformity of distribution of the chemical over the treated area has been developed.

Observations in the Milford Laboratory show that the particles of lime must come into direct contact with the body of the starfish to be effective. Particles of the chemical falling on the upper surface of the starfish imbed themselves in the delicate skin and rapidly cause its disintegration through caustic action. Lesions so created rapidly increase in size, spreading in all directions and involving the delicate respiratory and other structures found on the dorsal surface of the starfish. After several days the lesions penetrate the body wall, exposing the internal organs. Death usually follows very shortly. Starfish which are not hit by falling particles as the chemical is being applied may eventually come into contact with it by crawling on the bottom. Lime spread on the bottom retains its effectiveness for some time.

Laboratory experiments conducted in large tide-filling concrete tanks indicated that coarse grades of lime, even when used at the rate of 3 barrels (840 pounds) per acre, do not cover the bottom evenly but permit many starfish to escape. Finely powdered lime was found to be much more effective, even in concentrations as light as 280 pounds per acre.

To determine the effect of quicklime on other animals, experiments were carried out with oysters, flatfish, and lobsters, which support the most important fisheries in Long Island Sound.

Oysters which were subjected for a period of 5½ months to a very strong concentration of quicklime survived, although their growth and increase in weight were somewhat retarded. It must be considered, however, that the concentration of lime in the tank was much greater than that expected to be used on natural beds, and that even if such a concentration were used, it would persist only a short time. It appears, therefore, that lime may be used without endangering the oyster population. Seed oysters survived in lime solutions as well as the adult oysters.

Claims that spreading lime over oyster bottoms will restore the normal color of green oysters were not substantiated by field or laboratory observations. Treatment with lime had no effect on the green color of the oysters.

Large numbers of hard clams, soft clams, and two species of mussels kept in tanks to which a large quantity of lime was added at monthly intervals survived this exposure for a period of 6 months. Mortality among these animals was not noticeably higher than in the control tanks. Field experiments also showed that there was no mortality which could be attributed to the effects of lime among mollusks dredged from the beds where experiments in the eradication of starfish were conducted.

Experiments performed at the State Hatchery at Noank, Conn., showed that the fry of flatfish will survive for 1 hour in a 1 : 1000 concentration of lime provided they do not come in contact with solid particles. In the latter case death quickly results. Experiments with flatfish eggs obtained from the State Hatchery and taken to the Milford Laboratory showed that exposure in concentrations of 1.0 gr. of lime in 250 cc. of water did not materially increase the rate of mortality, but when the eggs were allowed to come in contact with particles of undissolved lime a mortality of almost 100 percent ensued.

Observations on the effect of lime on lobster larvae of the first, second, and third stages were carried out at the Noank Hatchery in June. In the filtered 1:10 solution the larvae of all stages survived for 4 hours. Similar results were obtained when larvae were subjected to a concentration of 1 part saturated lime solution to 2 parts of sea water. However, in a solution of 1 part of lime water to 1 part of sea water, a mortality of about 25 percent resulted at the end of 4 hours. All three larval stages appeared to be affected equally. In a saturated solution of lime all the animals died in 3 hours or less. In this solution the larvae of the first or earliest stage appeared to be the most resistant. Direct contact of lobster larvae with particles of lime resulted in death.

These experiments indicate that the use of quicklime on oyster bottoms should be restricted to seasons when no larvae of commercial species are present in the water, thus avoiding the danger of destroying them.

*Distribution of starfish in Connecticut waters.*—In cooperation with the Connecticut Shellfisheries Commission two surveys were made to determine the abundance of starfish on oyster bottoms between New Haven Harbor and Penfield Reef. The results of these surveys were immediately communicated to the oystermen, permitting more efficient eradication of this pest by private planters. It is planned to expand this service in the future by making surveys every 3 months and issuing the results in bulletin form to be distributed among the interested parties.

*Improvements at the Milford station.*—During the past fiscal year the Bureau obtained title to property at Milford, pursuant to the provisions of an act of the General Assembly of Connecticut, for the erection of a laboratory building and the establishment of grounds for experimental work on oyster culture. A special allotment of $35,000 was made by the Public Works Administration for the construction of a two-story brick laboratory. Work will begin early in 1939. Additional funds granted by the Works Progress Administration and Public Works Administration are being used for the construction of a sea wall and pier, filling the grounds, construction of tidal tanks, and other improvements.

*Oyster propagation in North Carolina.*—In the South Atlantic region there is great need of the development of oyster cultivation, and of special methods whereby oysters of good marketable size and quality can be grown on the extensive tidal flats. Although generally favorable conditions for oyster growth are found in these areas, the product obtained there is of inferior size and quality because of the overcrowding that results from prolific natural reproduction. One of the chief problems is the development of a practical procedure whereby seed oysters placed on the tidal flats can be protected from crowding and "fouling" of the shells by attachment of oyster spat, barnacles, etc., and grown to marketable size as single individuals of good quality. The three principal lines of investigation conducted by Dr. H. F. Prytherch during the past year at Beaufort, N. C., in the study of this problem, were to determine (1) the rate and character of growth of seed oysters fastened to panels of cement, wood, and wire placed at different tidal levels, (2) the practicability of using devices of this type for intensive oyster culture, and (3) the possibility of utilizing specially constructed salt marsh ponds for concentrated growing of oysters by controlling setting, and preventing injury to the shells by the boring sponge.

One hundred and eighty seed oysters were attached to cement panels and studied individually with respect to growth in weight, volume, length, and width in relation to their position above and below low-water level and their orientation on the panels. The seed used were 1 year old, uniform in size and shape, and showed the following average measurements per oyster: Weight, 15.5 g.; volume, 95 cc.; length, 51 mm. (2¼ in.); and width, 30 mm. (1¼ in.). Three series of panels were placed at the main pier in Beaufort Harbor so that series No. 1 was 1 foot above mean low-water mark, series No. 2, 1 foot below this level, and series No. 3 on the bottom, or 6 feet below low-water mark. Each series consisted of 60 seed oysters that were cemented in groups of 10 on 6 panels and oriented in the following 6 different positions: Horizontal with left valve down, horizontal with left valve up, vertical with hinge up, vertical with hinge down, sideways with mouth up, and sideways with mouth down. Special care was taken to arrange the panels so that all the oysters in each series had the same environmental conditions.

The principal results of these experiments, briefly summarized, demonstrate that (1) the growth of oysters is most rapid in the tidal zone immediately above low-water level and slowest on the bottom, (2) the greatest increase in weight and size occurs in seed placed in a vertical position with the hinge uppermost, regardless of tidal level, (3) the next best growing position is sideways with the mouth of the oyster upwards, which produces the finest shape and depth of shell, and (4) the procedure of attaching seed to panels, screens, etc., and placing them in the most favorable tidal zone and individual positions, as indicated above, will yield an increase in volume of over 400 percent during the first year.

The remarkable growth obtained with the best group of oysters of the entire series showed the following increase during the first year: Weight, 360 percent; volume, 410 percent; length, 100 percent; and width, 94 percent. Every oyster of this group attained a good size and shape and exhibited unusual individual growth that ranged from an increase of 190 to 575 percent in weight, and from 210 percent to over 660 percent in volume. The results obtained thus far by the panel method of intensive oyster culture are encouraging as they indicate that a yield of over 5 bushels of marketable oysters, with a value of $5.00, may be obtained from 1 bushel of seed having an initial cost of 25 cents. This permits an expense of several dollars to cover the operations of placing each bushel of seed on panels and caring for them over a 2-year period. Studies are being continued to perfect an inexpensive type of panel that can be used indefinitely, and to improve the temporary coating that was applied to the shells of the oysters to protect them from attachment of spat, barnacles, boring sponge, etc.

Construction of a series of tidal ponds in the salt marshes has been completed with the aid of W. P. A. labor. Here principles of oyster culture similar to those described above are being tested on a small commercial scale. Several hundred bushels of seed oysters have been planted in the ponds and ditches, where, by control of water levels and tidal currents, it may be possible to produce oysters of good marketable size under protected conditions. This work may have important practical applications in demonstrating how the extensive salt marshes in the South Atlantic region may be converted into oyster-producing areas.

*Oyster destruction by starfish in South Atlantic waters.*—In the coastal waters of North and South Carolina destruction of oysters and other shellfish by starfish occurs to a limited extent in the more saline waters of sounds and bays adjacent to inlets. At the Beaufort Laboratory studies of the oyster-consuming ability of this pest were conducted over a period of 1 year by Dr. Prytherch. During the first 6 months (January June) the 10 starfish in the experimental tanks devoured over 1,750 oysters ranging in age from 1 to 3 years. The number of oysters eaten per month over this period ranged from 183 to 456 and was greatest during March and least during June, when the starfish were undergoing the processes of gonad development and spawning.

After July first only large oysters, 3 and 4 years old, were kept with the starfish and during the following 6 months a total of 470 were eaten, the number per month increasing rapidly with the lowering of water temperature. The starfish were frequently observed to leave a partly consumed oyster and almost immediately begin an attack on another specimen, especially after they had been well fed for several weeks. Records of oysters attached to kymographs show that starfish are able to open large specimens in 3 or 4 hours. Analyses are being made of the secretions of starfish stomachs, as they are supposed to be an effective agent in opening shellfish.

*Establishment of experimental farms in South Carolina.*—Early in November the Bureau, in cooperation with the South Carolina State Board of Fisheries and the Works Progress Administration, initiated a program for rehabilitating and developing the oyster resources of the State through the establishment of a series of small experimental oyster farms. The primary purpose of this undertaking is to enable tide-water residents in the lower income brackets to obtain their subsistence, in whole or in part, by leasing and cultivating small plots of from 2 to 10 acres of oysters. The program differs from all previous experiments in presupposing that capital requirements will be at a minimum, and that primary materials, equipment, and supplies may be obtained or produced by the labor of the oyster farmer himself.

As early as 1890, interested persons were instrumental in having a survey of State oyster bottoms made by the Bureau of Fisheries, but only within the last few years have leasing laws permitted or encouraged extensive private holdings. A considerable acreage is now so held, but full development of the bottom cannot be accomplished until three major problems are solved.

The first requires development of an inexpensive method for obtaining single seed oysters in place of the massed clusters occuring naturally. This is essential to production of high quality oysters.

In the second place, variations in local water conditions must be understood so that advantage may be taken of those areas where growth and fattening occur most readily. On account of the long spawning season resulting from high water temperature, fattening occurs very late in the season. Southern growers are thus placed at a disadvantage in supplying fat oysters early in the season when the market is usually most favorable. Finally, methods must be devised for using suitable bottom below low-water mark. Under natural conditions, oyster spat attach themselves only between high and low water marks, with consequent restriction not only in the areas available for cultivation, but also in the number of hours the oyster may remain open for feeding.

In view of the importance of these and related problems to the Southern oyster industry, on November 1 the Bureau began an examination of available tidal streams in Beaufort County, S. C., with the view of selecting several areas suitable for small experimental oyster farms of several acres each. This work, in cooperation with the South Carolina State Board of Fisheries, was carried out by R. O. Smith, and several localities were marked for experimentation.

During 1939, various types of bottom will be tested to determine the most suitable treatment for seed and market oysters, and experiments will be carried out to find practical methods of seed collection on a small commercial scale.

*Oyster investigations on the Gulf coast.*—The oyster industry of the Gulf coast in general has for several years been in a relatively unsatisfactory condition, owing in part to the fact that it depends largely upon natural oyster beds which have been depleted by predators and by too intensive harvesting. The problems will apparently have to be solved by establishing oyster farms on privately leased or owned grounds and by studying the fundamental biological problems concerned before the industry of the coast can be conducted economically.

The program of oyster investigations which has been undertaken at the Pensacola (Fla.) Laboratory consists primarily of the following phases: (1) Establishment of an experimental oyster farm on a semicommercial scale to determine rates of growth and fattening, productivity annually per unit of bottom, and costs of production, including a study of natural hazards and predators of the Gulf coast. It is planned to compare the results with those of similar projects conducted by the Bureau in Atlantic waters. (2) Experimental laboratory and field studies of factors influencing the growth and fattening of oysters under conditions characteristic of most oyster-producing areas of the Gulf coast, particularly with reference to fluctuations in salinity.

Pending establishment of the experimental oyster farm, Dr. A. E. Hopkins has been working in close cooperation with the Florida Department of Conservation and the Works Progress Administration in a program of oyster planting and rehabilitation of exhausted natural beds in portions of Pensacola Bay. Observations to date indicate that East Pensacola Bay is very favorable for experimental study. Programs were also organized for the rehabilitation of natural oyster grounds in Apalachicola Bay, St. Andrews Bay, and Choctawhatchee Bay. In addition Dr. Hopkins made a number of trips to Mobile Bay at the request of the Alabama Oyster Commission to advise on immediate problems and assist in forming a general policy of control of the natural beds.

During the year it has been demonstrated that the location of the Pensacola Laboratory, on Santa Rosa Sound, is most satisfactory for its purposes. The water was almost always clear and the salinity varied from about 20 to about 27 parts per thousand in ordinary weather to as low as 12 to 15 parts per thousand during 2 short periods of extreme spring freshets. The water temperature throughout the year followed closely that of the air, and averaged in midsummer about 74° F., in mid-winter about 60° F. Oysters, fish, and other organisms have thrived well in the laboratory aquarium.

With the assistance of relief funds from the Works Progress Administration and the Public Works Administration a program of development of the station was undertaken at the end of the summer. It is expected that early in 1939 the Pensacola station will be adapted to any type of fishery research.

*Effect of pulp-mill pollution on oysters.*—Investigations carried out by the Bureau between 1935 and 1937 at the Yorktown Laboratory have clearly indicated that pollution of the river by pulp-mill wastes has been responsible for the decline of oyster production. During 1938, Dr. Walter A. Chipman, Dr. H. N. Calderwood, R. O. Smith, and Lloyd R. Garriss have attacked the problem of determining what chemical or chemicals present in the pulp-mill effluents are the cause of the altered physiology of oysters. The investigators will later attempt to develop a means of eliminating such harmful substances.

The work has been continued on a cooperative basis with the Virginia Commission of Fisheries, which contributed $5,000, and with the cooperation of the College of William and Mary which granted the use of the chemical laboratory and office space in the college building at Williamsburg. In addition to the work in Virginia, special phases of the York River pollution problem were investigated in the Washington Laboratory by Dr. Galtsoff, with the assistance of Dorothy B. Hamilton. These were the abnormal shell structure and other pathological conditions found in oysters from the polluted areas of the York River.

In testing the effectiveness of pulp-mill wastes in reducing the amount of water pumped by oysters, it has been observed that only one of the various effluents entering the York River from the pulp and paper mill at West Point has a marked physiological action—that arising from the pulping process. This mill has three main sewer ditches; one draining a sludge deposit, one receiving wastes from the paper mill and causticizing section, and one carrying the wash waters from the diffuser and the digester building and evaporators.

Frequent sampling of the discharges from the sewers has revealed wide and irregular fluctuations in the character and physiological activity of the effluents. However, these effluents have been grouped under three main categories for the purpose of study: crude sulphate soap, foam from the mill sewer outlets, and weak black liquor.

At times considerable quantities of crude sulphate soap find their way into the effluents, being washed in from the ground surrounding the black liquor storage tanks. These soaps have a marked physiological action in reducing the rate at which water is pumped by oysters. Fractionation of crude sulphate soaps has yielded portions both physiologically inactive and physiologically active. Studies are under way for the purpose of isolating, if possible, the single active constituent. A future study will be the determination of the part the physiologically inactive materials may play in the distribution and duration of the potency of the active portions.

Frequently large quantities of foam are observed in ditches leading to the river. Examination of the foam indicates the likelihood of its being a soap rather than a saponin. Further work is planned on the chemical nature and the effect on oysters of this material.

Tests of material entering one of the sewer ditches from an overflow of foam from the weak liquor storage tanks indicate that this material is chiefly a dilute form of the so-called "black liquor" which results from the digestion of the wood chips, with possibly an addition of a small amount of soap.

Chemical investigations are planned on black liquor samples for the purpose of finding whether any correlation exists between the alkalinity and volatile sulfide content of the various black liquor samples and the variations in effect on oysters exhibited by these samples. Fractionation of the black liquor will be undertaken, and efforts to develop a reliable method for the detection and determination in river waters of constitutents of the black liquor will be continued.

Tests on the physiological effectiveness of pulp-mill effluent have shown that storage of weak black liquor in air brings about a slow loss in potency. It seems that this change is chiefly in oxidation, since agitation in the presence of pure oxygen under pressure rendered the material physiologically inactive, whereas the effluent stored under hydrogen held its potency at a constant figure for periods of from 2 to 3 months.

## SPECIAL SURVEYS

Under the direction of Dr. Galtsoff, a study of the sequence of fouling organisms on experimental panels exposed by the United States Navy at Cavite, P. I., and Guantanamo Bay, Cuba, was completed by G. Robert Lunz, Jr., and the report was prepared and submitted to the Navy Department. Preliminary experiments on the nature of the fouling film were carried out at Langley Field, Va.

At the request of the United States Engineers, Dr. Galtsoff made a survey of oyster bottoms in Onset Bay claimed to be affected by dredging operations in the Cape Cod Canal. Numerous samples of water and oysters were taken for examination. Certain areas were found to be covered with recent deposits of sand and mud and contained large numbers of dead oysters. Since the examinations were made long after the completion of dredging operations in this section, the cause of the mortality of oysters could not be ascertained.

Another survey of similar nature was made in Narragansett Bay at the request of the United States District Engineer in Providence. Fortunately, in this case, the survey was made while the dredging operations were still in progress. Samples of oysters were obtained from 16 stations on both sides of the canal. Examination of oysters revealed no ill effect from the dredging operations. There was no accumulation of mud on oyster shells or in the shell cavities. The oysters appeared to be healthy and normal. It is planned to continue these surveys in Narragansett Bay as long as the dredging operations last.

*Mortality of shellfish, Myrtle Sound, N. C.*—At the request of the North Carolina Department of Conservation and Development, Dr. Prytherch made a survey of an unusual mortality of clams and oysters in the waters of Myrtle and Masonboro Sounds. It was found that hydrographical and biological conditions in these sounds had changed considerably since the construction of the Intracoastal Waterway and had proved to be detrimental to the growth and propagation of shellfish in this coastal region. The most important modification is the connection of the Cape Fear River with the southwest end of Myrtle Sound by means of a canal, approximately 100 yards wide, known as Snows Cut. This canal, being open at all times, permits a considerable quantity of fresh water, or water of low salinity, to flow into Myrtle and Masonboro Sounds. During flood stages of the river especially large quantities of fresh water, heavily laden with mud, pass continuously through these sounds for extended periods and enter the ocean at Masonboro Inlet. During the early part of August the unusual floods occurring in the Cape Fear River Basin produced such extreme freshening of the water in these sounds as to cause destruction of the natural supply of clams and oysters.

The value of the oyster crop of this region, which prior to 1932 was approximately $3,000 annually, decreased to less than $400 in 1936 and 1937. It is evident that the clam and oyster resources of this section, which have a combined value of $15,000 annually and serve as a means of food and livelihood for a large number of local people, should be restored after some satisfactory flood control devices have been installed to control the flow of fresh water from the Cape Fear River.

## AQUICULTURAL INVESTIGATIONS

Dr. H. S. Davis, *in charge*

It has long been recognized that our inland waters constitute one of the great natural resources of the country which, like other resources, are now suffering serious depletion. Industrial and agricultural development have so changed the nature of many waters that they are no longer suited to fish, while the majority of those that are still capable of supporting game and food fishes are badly overfished. These conditions can best be corrected by wise management combined with artificial propagation.

The work of the aquicultural investigations has developed along three principal lines. One deals primarily with field problems and the provision of much-needed information on the best means of obtaining the maximum production of game and food fishes consistent with environmental conditions. A second line of investigation is concerned with problems relating to the artificial propagation and rearing of fish, while the third deals with fish parasites and diseases, and their control.

## TROUT

It is the purpose of the investigations on trout waters to obtain definite information on the annual drain to which the trout population is subjected by anglers, and the value of artificial stocking in maintaining a stable fish population. Attention is also being given to the correlation between normal production and the available food supply and other factors which must be given consideration in developing management policies.

*Test streams.*—The scientific work at the Pittsford (Vt.) station, under the direction of R. F. Lord, was again chiefly concerned with studies on test waters. Waters set aside for this purpose include three streams and one lake operated in cooperation with the State Fish and Game Service. On one of these streams, Furnace Brook, a State game warden was stationed each week end to examine anglers' catches for marked fish and to obtain data on the lengths and weights of all trout taken from the stream.

On both Furnace Brook and the South Branch of Middlebury River the total catch for the season was considerably less than in previous years. Unfavorable conditions during the winter of 1937–38, when heavy winter rains raised the streams to flood stage with much damage from floating ice, are believed to have been the cause of the exceptionally poor stream fishing throughout the State.

The superiority of rainbow over brook trout in contending with adverse conditions is again brought out clearly in the results from Furnace Brook. As pointed out in previous reports, no rainbows have been planted in Furnace Brook for years, while the stream is heavily stocked each year with fingerling brook trout and, for several years past, with yearling brook trout as well. Nevertheless, the catch of brook trout has shown a gradual decrease each year while the decrease in the catch of rainbows has been comparatively slight, with the result that the proportion of rainbows rose from 34 percent in 1935 to 38 percent in 1937. In 1938 this trend was accelerated; rainbows increased to 62 percent, while brook trout provided only 38 percent of the catch. Furthermore, the average catch of rainbow trout per angler, which had remained constant during the preceding years at 2.4, in 1938 jumped to 3.7.

The returns from 5,200 yearling brook trout planted in Furnace Brook in the fall of 1937 were very disappointing, only one percent of these fish being reported by anglers. The 1937 record of only 12 percent recovery was thought low but it remained for adverse wintering conditions to show how a fall plant of yearlings could be a total loss.

Fish population studies were made on the three test streams in cooperation with the United States Forest Service. The procedure was to block off a section of the stream with seines at the upper and lower ends. These were weighted with stones so as to prevent any fish entering or leaving the section. A dam of burlap sacks filled with sand was then constructed across the upper end of the section so as to divert the water into another channel. Any pools that could not be drained were pumped dry so that every fish present could be captured. The average number of trout per acre in three sections of Furnace Brook was 835, with a total weight of 35 pounds, 11 ounces. Only 15 percent of the trout were of legal size, 10 percent of these being brook trout.

In the South Branch of the Middlebury River the average number of fish (based on two sections) was 1,650 brook trout per acre, with a total weight of 54 pounds, 10 ounces. As in Furnace Brook, 15 percent of these fish were of legal size. There were no rainbow in Middlebury River and fish other than trout were too few to be of any significance.

The West Branch of the White River was found to have a much smaller population of trout. Three sections of this stream yielded an average of 376 trout, weighing 14 pounds, 10 ounces, per acre. This stream also supports considerable numbers of sculpin, dace, and suckers which, when added to the trout, give a total of 20 pounds, 14 ounces of fish per acre.

*Studies on St. Marys River.*—Monthly collections of bottom and chemical samples on the St. Marys River, Virginia, were continued during the spring, summer, and fall of 1938, to determine the effect of different current velocities on abundance of bottom animals in riffle areas. Samples collected during the past 2 years have been very uniform, with an average weight of slightly over one gram per square foot. In contrast with streams in the Southern Appalachians, there were fewer organisms in summer than at other seasons.

It is evident that stocking St. Marys River with fingerling trout has not produced worthwhile results and that rainbow trout disappear before they reach legal size.

*Investigations in Pisgah National Forest.*—The experimental fish-management program in Pisgah National Forest, North Carolina, was conducted for the second year in cooperation with the United States Forest Service. The project sustained an irreparable loss on January 4, 1939, in the death of Wm. M. Keil, who had been in charge of the project for the Forest Service since its inception. The work will be continued by Thomas K. Chamberlain, who has been conducting the biological studies for the past 2 years.

During the late summer and early fall of 1937 the streams of the Wildlife Management areas of the forests were stocked for the first time under the new program. After determining the carrying capacity of these streams, brook, brown, and rainbow trout were planted by the most approved methods. In order to develop and maintain satisfactory fishing it had been decided to plant larger fish and to develop some system of rotating the open season on the several watersheds in order that each stream might have a period of rest after being fished and restocked. Several of the streams were opened to a limited amount of fishing during the summer of 1938.

The danger of overstocking when streams are not rich in food has been demonstrated in several small streams of this area. In one instance a planting of brook trout averaging over 6 inches long was made in the fall. These fish remained in excellent condition through the winter but in early spring they began to decline, and, in late summer, 10 months after planting, their average weight was less than when first put into the stream.

Stream studies were carried out by Mr. Chamberlain to determine the rate of stocking for the various waters. Quantitative collections of food organisms were made from 977 square feet of trout-stream bottom in the Pisgah Forest alone. Observations were also made on the trout present and on stream conditions in general. While streams in the Pisgah Forest received most attention, a start was made in studying the main streams of the Cherokee, Chattahoochee, and Nantahala National Forests, where food conditions appear to be much the same as in streams of the Pisgah Forest.

In general, the forest streams in this region may be classified as medium to poor. Most of them still suffer from excess of sediment, due largely to road construction and in some parts of the Pisgah Forest to overbrowsing by deer. However, conditions appear to be improving and were it not for uncertainties in future road construction the outlook would be distinctly encouraging.

*Feeding experiments.*—Extensive feeding experiments with fingerling, yearling, and adult trout were carried on at the Leetown station, supplemented by experiments with fingerlings at the Pittsford station. These experiments were designed primarily to determine the effect on growth, mortality, and egg production of dry meals fed at different levels and in different combinations.

In general, it was found that fresh meat is more efficiently converted into fish flesh than dry feeds but, owing to the lower cost of the latter, it is more economical to incorporate a considerable percentage of these products into the diet. Using a mixture of the better dry meals, best results were obtained when the meals were fed at a level of 40–50 percent.

One of the most striking results was the marked increase in growth following the addition of 3 percent cod-liver oil to a diet composed of sheep-liver and whitefish meal. Overfeeding failed to produce high mortality or any evident pathological effects.

Experiments with brood fish showed considerable variation in the hatchability of eggs from fish on different diets, amounting in some cases to over 50 percent. Overfed lots produced twice the number of eggs per female obtained from underfed fish on the same diet but the percentage of eyed eggs was more than 10 percent greater in the underfed lot.

*Cooperative nutrition studies.*—Studies on the nutrition of trout were continued under the cooperative agreement between the Bureau of Fisheries, the New York Conservation Department, and Cornell University. These investigations are carried out at the Laboratory of Animal Nutrition of the New York State College of Agriculture at Ithaca, N. Y., and at the Cortland (N. Y.) Hatchery of the Bureau of Fisheries. The staff conducting these studies consists of Dr. C. M. McCay, A. V. Tunison, A. M. Phillips, E. O. Rodgers, and C. R. Mitchell. Inasmuch as detailed reports of the progress of these investigations are published annually by the New York Conservation Department, only a summary of the results is included in this report.

The study of the growth rates of four species of trout during a period of more than 5 years (March 10, 1933–September 16, 1938) has been terminated. The trout used were lake, brown, rainbow, and brook. In this study the best survivors were the lake trout. These continued to grow, but at a very slow rate, until discarded. The brook trout were the poorest from the point of view of survival. The growth curves of these four species ran parallel throughout.

During the past few years many new vitamin concentrates have been made available, opening new possibilities for determining the needs of animals for vitamins. During the past year new studies were made employing synthetic diets supplemented with liberal supplies of vitamin concentrates. All recognized vitamins were included in these supplements but this mixture could not replace the factor H of fresh meat. Present knowledge about the part any of the vitamins play in the growth and well-being of trout is extremely limited.

New attempts were made to prepare concentrates of factor H from liver but with little success. Ten percent of fresh liver added to a synthetic diet seems to satisfy the requirements of trout for all vitamins. In accordance with our earlier studies it seems that liver retains part of its factor H when dried in vacuo.

Studies with meats and fish preserved in various ways have been continued. Some success has resulted from feeding meat such as spleen preserved with salt. No injurious effects have resulted from feeding high levels of salt to brook trout.

Since ordinary dry feedstuffs contain about 10 percent of moisture, an attempt has been made to dehydrate fresh meat by mixing it with very dry feed mixtures. By starting with a very dry diet sufficient fresh meat can be added to bring the mixture to its normal content of about 10 percent. Preliminary tests with this method indicate that part at least of the factor H is preserved.

*Intermountain Region.*—Fish management work in the Intermountain Region in cooperation with the United States Forest Service and the fish and game commissions of the several States, which had been discontinued for several years, was resumed with the appointment of Dr. Stillman Wright as regional biologist. Dr. Wright established his headquarters at Logan, Utah, on June 9, where the State Agricultural College has very generously provided adequate laboratory facilities for him and his assistants. Since entering upon his duties Dr. Wright has spent considerable time familiarizing himself with conditions in this region, in the course of which he has traveled approximately 17,400 miles by automobile.

Trout are the principal game fishes of this region in which, as elsewhere, the number of anglers and consequent intensity of fishing is increasing very rapidly. Failure of the fisheries to maintain themselves under the heavy demands of the public is evident in the streams, particularly those near centers of population. In lakes and reservoirs excessive removal of trout is usually followed by a great increase in the less-desirable species. Factors other than overfishing are, however, involved in the general decline of the fisheries in this region. Silting, resulting from overgrazing and accelerated erosion, makes streams less suitable for trout. In many streams hydroelectric and irrigation projects interfere with normal migrations, while fluctuations of the water level in reservoired lakes interferes with normal spawning and may have other detrimental effects. Because of the variety and critical nature of the many problems involved, it is evident that for some time investigations in this region must be directed toward the formulation of management plans for waters showing possibilities of immediate improvement of fisheries resources.

During the past summer special attention was given to Fish Lake, Utah, which formerly supported a highly productive fishery for rainbow, mackinaw, and brook trout. Some years ago the Utah club was introduced and has since become extremely abundant. As the chub increased in numbers the brook trout decreased in abundance and average size until it is now a negligible item in the catch. There is reason to believe that the rainbow and mackinaw are also on the decline.

The results of earlier studies combined with those of last summer have made it possible to formulate a program of management which gives promise of improvement in the fishery. The following recommendations have been made to the State Department of Fish and Game: (1) That a program of eradication of the Utah chub be instituted, (2) that a forage fish especially suited to the needs of the mackinaw trout be introduced, (3) that plantings of rainbow and mackinaw trout be continued, (4) that the present catch limit be drastically reduced and that attempts be made to develop other lakes for fishing, so as to decrease the fishing intensity in Fish Lake.

In the search for a forage fish to meet the needs of the mackinaw trout, attention was directed to Bear Lake, Utah and Idaho, which has three species of Coregonidae found nowhere else. One of these, the Bonneville cisco (*Leucichthys gemmifer* Snyder), may prove to be a valuable forage fish, and a study of its life history has been begun. A more detailed study of Bear Lake is planned for 1939. At the present time the trout fishery in this lake is in a deplorable condition and a number of factors conspire against improvement.

*California trout investigations.*—The work of this research unit has remained under the direction of Dr. P. R. Needham, with headquarters at the Natural History Museum of Stanford University. Dr. Osgood R. Smith was appointed to the staff in the position of Assistant Aquatic Biologist. The cooperative agreement that had been in effect since 1932 with the California Division of Fish and Game was abrogated by mutual consent on July 1, 1938.

Cooperation with the United States Forest Service was continued, but lack of funds limited the extent of the work. Angling catch records were taken for a second season on Fish Lake, in the Umpqua National Forest, Oregon. Lack of funds caused abandonment in August of the survey of the North Fork of the Umpqua River and its tributaries when only partially completed. The survey of lakes in the Willamette National Forest was completed and a report covering the entire three years' work and containing stocking policies for all lakes suitable to fish life is now being prepared. A survey of lakes in the Columbia National Forest in Washington was begun, and it is planned to continue the work next season if funds are available.

Complete catch records were secured for a second season on Squaw Creek in the Shasta National Forest, Calif., and a report is being prepared that will cover the 2 seasons' activities.

*Loss of Mexican trout.*—The flood of March 2, 1938, in southern California completely destroyed the Forest Home State Fish Hatchery, near Redlands, and with it both the adults and eggs of *Salmo nelsoni* brought to California from Baja California, Mexico, in the spring of 1937. An attempt will be made to secure another lot of these fish for breeding purposes.

*Convict Creek experimental stream.*—Experiments to determine the survival rates of hatchery-reared trout planted under controlled conditions were continued. Fifteen plants of marked rainbow and brown trout were made in the experimental stream, 13 of which were successful. The survival from plants of advanced fry and eyed eggs gave further confirmation of last year's results. From a plant of 3,000 eyed cutthroat eggs, 465 fish, or 15.5 percent, survived after 51 days. A slightly higher survival of 21.7 percent was obtained from a plant of 2,000 unfed fry. These results were obtained under light predation, and survivals are slightly higher than any obtained last year. In contrast, a plant of 1,000 unfed fry showed a survival of only 1.4 percent under heavy predation, 64 wild trout being taken from this section at the end of the experiment.

Brown trout fingerlings, planted at the usual size at which they are planted from State hatcheries, showed surprisingly high survivals after 3 months. For instance, in one section a survival of 76.4 percent was obtained after 94 days, in spite of the fact that 117 wild trout were also present in the section. These fish were planted at a length of 1.5 inches and averaged 3.2 inches at the end of the experiment. By way of comparison, wild brown trout of the same age, netted from Convict Creek, showed a survival of over 89 percent after 97 days under heavier predation.

Small rainbow trout, averaging 1.7 inches in length, planted in two experimental sections, showed survival rates of 75.6 and 83.1 percent, respectively, after 95 days. These fish were planted without removing wild fish and no effort was made to protect them from other predators.

One of the most surprising results has been the large numbers of naturally spawned fish that are found in the experimental sections at the end of the season. This year a total of 1,123 wild brown, rainbow, and eastern brook trout were removed from the 15 experimental sections, an average of 74 wild fish per section.

Some much-needed improvements were made during the past year, including the construction of a small cabin for living quarters, and a few changes in the experimental section. Floodwaters in late June interfered with the experiments to some extent. Late in the fall a flood diversion ditch was constructed which will make it possible to divert at least a portion of high water out of the main channel and around the experimental area.

*Shasta Dam survey.*—A party of four biologists, employed by the United States Reclamation Service, has been engaged in an investigation of the salmon-salvage problems resulting from the construction of the Shasta Dam on the Sacramento River. This work is under the immediate direction of Dr. Smith. During the summer most of the spawning areas above the dam were located and measured to determine the extent of such areas that will be destroyed upon completion of the dam. Streams below the dam were also examined for suitable spawning areas.

On the basis of counts made of salmon passing over the fish ladder at the irrigation dam at Redding, it is estimated that there are approximately 20,000 salmon in the fall run alone, which would indicate a potential deposition of over 70 million eggs in the area that will be cut off by the dam.

*Dam debris survey.*—Late in June a crew of four men was employed by the United States Engineer Corps to make a study, under the direction of Dr. Smith, of the fisheries problems arising from the construction of three dams on the American and Yuba Rivers in California. Data were gathered during the summer by standard stream survey methods and, in addition, two men were employed to count salmon ascending the rivers. The counts were incomplete and do not include a reputedly sizeable steelhead trout run. They do, however, indicate that it will be mainly sport fishing and not the commercial salmon fishery that will be affected by the dams and mining debris.

*Survey of Pyramid Lake, Nevada.*—A survey of Pyramid Lake and its fisheries problems was made between March 7 and June 8 at the request of the Indian Service. Francis H. Sumner was stationed at the lake to gather biological, physical, chemical, and historical data on the lake and on Truckee River, which formerly was the spawning ground of great runs of cutthroat trout. With the aid of Indian wardens a record was kept of the commercial catch made by the Indians, which has declined greatly in recent years. Length-frequency and age studies show that the run is at present made up almost entirely of old fish, averaging 34 to 35 inches long, and that the younger age groups are not represented. This age and frequency is the reverse of that usually found in an over-exploited fishery. It appears that the run was but a remnant of a race that has practically ceased to reproduce, from lack of spawning facilities. Overfishing by the Indians has probably been a factor in depleting the run, but it is evident that the diversion of the Truckee River water has been the major cause. It is considered doubtful that rehabilitation could be effected by any means.

### BASS

*Studies on streams in Virginia and West Virginia.*—Field work on bass streams, begun in 1936, was continued at the Leetown (W. Va.) station by E. W. Surber and George E. Klak.

These studies are designed primarily to determine the extent and efficiency of natural propagation of bass and the effect of intensive fishing on the bass population. They show that, even in heavily fished waters, there is little danger of the bass population being seriously depleted if adequate spawning facilities are available. Intensive fishing frequently results in excessive numbers of small bass, with consequent reduction in the abundance of forage fishes. It is apparent that the remedy is to build up the food supply and that stocking with young will only tend to intensify the unbalanced condition.

Monthly series of bottom samples were collected from the experimental sections of four streams, namely, the Cacapon River, South Branch of the Potomac River, North Fork of the Shenandoah River, and the Shenandoah River. This series of samples duplicates those taken in previous years. Special attention was given to measurements of current velocities at all sampling stations. Laboratory work on the bottom samples has been completed, but the data have not yet been analyzed.

Studies of the extent of natural propagation were continued in these four rivers. In contrast with previous years, interruption of the spawning season by cold weather and muddy waters brought about a second spawning early in June. In previous seasons spawning was completed by the 1st of June. The number of bass nests per mile was 70.7 in the Cacapon River, 81 in the South Branch of the Potomac, 24 in the North Fork of the Shenandoah, and 11 in the Shenandoah River proper. It is believed that in ordinary years an excessive number of fry are produced in the first two rivers. During the past year, however, high and muddy waters destroyed the fry as they rose from the nests and there was a decided scarcity of fingerling bass throughout the season. Routine monthly collections of fishes showed that a reduction in the numbers of fingerling bass is accompanied by an increase in the forage fish population. After July, collections of bass fingerlings for study became increasingly difficult or impossible because of their scarcity.

As in previous years, conditions in each stream were found to differ in many respects and each would require different treatment to bring about improvement in fishing. Minnow surveys were made in 11 experimental sections in an attempt to determine whether reasonably reliable data could be collected on the size of the forage fish populations in the four rivers concerned.

*Investigations in Florida waters.*—In recognition of the need for extensive studies on black bass and other fresh-water game fish in Southern waters, and their propagation by artificial means, headquarters for this work was established at the hatchery recently acquired by the Bureau at Welaka, Fla. This station, located on the banks of the St. Johns River, is admirably adapted to experimental work. There are a large number of ponds, ranging from seven-eighths to 2 acres in area, which have recently been remodeled to make them more suitable for experimental work. New buildings have been constructed which will provide adequate laboratory, office, and living facilities for biologists working at the station. Opposite the station, on the west side of the St. Johns River, is the Ocala National Forest, which contains several streams and a large number of lakes rich in aquatic life. Through a cooperative agreement with the United States Forest Service and the Florida State Commission of Game and Freshwater Fish, eventual management and control of all lakes in this area is contemplated.

Investigations in this area, both at the Welaka station and in the field, are being conducted under the direction of O. Lloyd Meehean. Mr. Meehean began his work on the waters of the Ocala Forest in April 1938, and later moved his headquarters to Welaka.

A survey of the principal lakes in the Ocala Forest was carried on during the summer of 1938 to provide information to be used in developing a management program for these lakes. The survey included plane-table mapping of the lakes by a crew of C. C. C. enrollees, complete soundings of each lake, and the determination of the species of fish present and their relative abundance. From this survey maps have been prepared showing bottom contours, the location, kind, and extent of weed beds, and other pertinent information.

Based on this survey, a stocking program has been worked out for 19 lakes that are fully controlled by the Forest Service. Most of the lakes are to be stocked with bass and sunfish, but several which appear ideally suited to crappie have been reserved for this species.

To determine the fishing demand to be expected on lakes of the forest, checking stations were set up on two of those most accessible to anglers. At these stations a complete census was started on May 21, the opening day of the fishing season, and will continue until the close of the season on March 21, 1939. Bottom samples, two types of plankton samples, and chemical data are also being collected on these lakes.

In addition to the lakes under management, seven ponds have been set aside for experimental work. This number will be increased as needed. These ponds will be utilized for stocking experiments and study of methods to increase the food supply of game fish in these waters, as the basis for improvement in the management program.

In the Choctawhatchee National Forest there are a number of streams that are inhabited by largemouth bass at the lower end where they enter coastal bays, but which contain no game fish higher up. These streams are peculiar in that the temperature of the water is about the same throughout the year. A study is being made of the physical conditions and life in these streams to determine how they can best be utilized.

Experiments relating to hatchery problems will be started early in 1939 when the remodeled ponds at the Welaka station will be ready for use.

## PARASITES AND DISEASES OF FISH

Facilities at Seattle, Wash., for the study of problems relating to fish diseases were greatly increased during the past year. These studies are under the direction of Dr. F. F. Fish. Two experimental laboratories are now available, each operated for a slightly different purpose. One is an enlargement of the field laboratory constructed at the Quilcene (Wash.) hatchery in 1937. The original temporary structure has been replaced by a permanent building constructed by the Division of Fish Culture according to plans provided by Dr. Fish. As this laboratory was planned primarily for testing scientific discoveries under controlled field conditions, it is not suited to all types of experimental work.

A second experimental hatchery has been provided, through the generous cooperation of the University of Washington, in the basement of one of the university buildings. This laboratory is supplied with chlorinated water, which is subsequently dechlorinated by passage through an activated carbon filter, thus assuring a disease-free source of water. The laboratory contains 24 small troughs which have proved highly satisfactory for this type of research. The main water supply to the troughs is controlled by a manually operated master valve and mixing chamber which permits the maintenance of any desired temperature in the troughs. When finances permit, the water supply of 10 of the experimental troughs will be additionally controlled by automatic thermostatic valves.

Much of the long-term scientific program of the Seattle Laboratory had to be considerably modified during 1938 because of the lack of suitable facilities during the construction period. As long as the original Quilcene Laboratory could be used, a series of toxicity studies was maintained to determine the maximum nontoxic concentration of disinfectants which fish could withstand for various lengths of time. The value of these concentrations in preventing certain diseases was then tested at producing hatcheries by means of routine 1-hour applications at weekly intervals.

During the course of the experiments, which extended over a period of 3 months, a serious outbreak of the Western type of gill disease occurred at the Birdsview (Wash.) Hatchery, and a mild outbreak at the Quinault hatchery. Prolonged treatments with malachite green, potassium permanganate, and chlorazene failed to exert any beneficial effect in preventing the disease. A considerable drop in the mortality followed treatments with copper sulphate and boric acid, but further experiments with both chemicals will be necessary before any conclusions concerning the prophylactic or therapeutic values of these disinfectants are justified.

During 1938 a new technique was developed for treating fish in relatively large volumes of water, such as are found in circular pools and in raceways. In this method the water supply to the pond is shut off and the amount of predissolved disinfectant necessary to attain the desired concentration is added. The water is kept mixed and aerated during the treatment by means of a centrifugal pump.

After completion of the new laboratory at Quilcene, a series of controlled infection experiments with the protozoan parasite *Cyclochaeta* were initiated. The purpose of the experiments was not only to trace the development of the disease under controlled conditions but primarily to determine the relationship between daily losses and the actual degree of infection present. The results indicate that while daily losses are by no means an accurate index of the degree of parasitism, and are unsuitable for experimental purposes, they are sufficiently accurate to serve all practical purposes.

Pathological studies on *Henneguya salminicola*, a myxosporidian parasite in the body musculature of several species of Pacific salmon, and similar studies on *Myxobolus inornatus* n. sp., a myxosporidian found in the body musculature of the black bass, were completed and the results prepared for publication.

At the Leetown station E. W. Surber completed a study of a peritrichous ciliate of the genus *Scyphidia*, which occurred in large numbers on the gills and bodies of black bass at this station. This parasite was discovered on a lot of largemouth fingerlings which suddenly stopped feeding. No attempt was made to control the infection and within a few days the fish suffered a sudden and almost complete mortality. Although a few *Dactylogyrus* and *Cyclochaeta* were also found on the fish the *Scyphidia* are believed to be the principal cause of the mortality. This is borne out by the fact that the same pond contained numbers of golden shiners which were more heavily infected with *Dactylogyrus* than the bass, yet suffered only a slight mortality. No *Scyphidia*, however, could be found upon these fish.

Dr. Davis continued his studies on a suctorian parasite of the smallmouth black bass which has been the cause of considerable mortality at Leetown among bass of all ages. This parasite is evidently widely distributed, since it has been found at several hatcheries in New York, New Jersey, and Maryland.

The "Disease Service" continued to function during the past year, about the same number of specimens being received for diagnosis as in previous years. One very gratifying feature is that some of the hatcheries have ceased to be steady clients of the service, which would indicate that the common diseases are now under better control.

Dr. Davis spent some time at the York Pond (N. H.) station in connection with an outbreak of furunculosis. In an effort to eradicate the disease the trout were either removed or destroyed and the ponds and hatchery disinfected with chlorine and hydrated lime. Owing to the nature and extent of the ponds this was a very difficult task but it is believed that it was accomplished successfully.

## INVESTIGATIONS IN INTERIOR WATERS

### Dr. M. M. Ellis, *in charge*

### POLLUTION STUDIES

Headquarters for the pollution studies have continued at Columbia, Mo., where the University of Missouri has courteously provided laboratory space and facilities. A subsidiary laboratory at Fort Worth, Tex., has also been maintained. The various phases of the pollution investigations are so organized that they contribute to the central purpose of determining the suitability of particular waters both in the stream and in the hatchery for different types of fishes, the detrimental action of many substances which enter streams or water supplies either naturally or through pollution, and reliable means for measuring the condition of the fish themselves. In this work cumulative effects and impairment of vital functions are receiving more attention than the immediate lethality, as the former are both more insidious and far reaching than the latter.

Three major lines of investigation are in progress at the Columbia field unit and the Fort Worth Laboratory.

*Analytical studies.*—Waters, muds, and aquatic organisms collected in the field are sent to the central laboratory for detailed analysis. Determination of these samples is carried out by Dr. B. A. Westfall and assistants. In addition to the materials collected in the course of field work conducted by the staff, a large number of samples are sent in for analysis by the various State agencies.

*Bioassays.*—The specific effects of materials found in waters, muds, and pollutants, on living fish and other aquatic animals, are determined by the bioassay method. The bioassays of pollutants sent to the Columbia unit by State authorities and other sources have grown to be an important activity of the laboratory, with 50 to 200 such assays constantly in progress. Equipment and procedures have been so standardized that it is possible to assign a considerable portion of this work to analytical assistants who carry on these tests as routine tasks.

*Physiological investigations.*—The underlying causes for the actions of the various substances found in natural waters and pollutants on living fish are sought through studies of the physiology of fish. This phase of the work is under the direct supervision of Dr. Ellis and is conducted both in the Columbia Laboratories and at Fort Worth. A major field of physiological investigation during the year was a study of the effects of various components of larvacides and herbicides on fresh-water fishes and associated aquatic food organisms. As the biochemical and physiological tests are quite exacting, each fish is maintained and studied as a separate patient, frequently for a period of several months. More than 200 such fish are under observation at Columbia, and upwards of 500 catfish are being studied as part of this investigation at Fort Worth. These studies have progressed to the point where it is possible to conclude that there is impairment of the growth and nutrition of fishes in waters treated with even small quantities of arsenicals and several other materials commonly used as mosquito larvacides. A separate report on this subject will be prepared early in 1939.

During the latter part of the year physiological studies were begun to determine the effects of several substances dangerous to fish life which were found in natural waters in the West in the course of the summer's field investigations. These studies are being carried out in both the Columbia and Fort Worth Laboratories.

*Summer field surveys.*—During the summer of 1938 intensive studies of stream pollution were made throughout the greater part of Western United States, and many new data were collected on the nature and effects of polluted waters. Observations were made in the States of Texas, Arizona, Nevada, California, New Mexico, Oregon, Washington, Idaho, Wyoming, Montana, Minnesota, North Dakota, and Nebraska. About 5,000 analyses were made in the field and additional material was returned to the laboratory at Columbia, Mo., for further analysis.

After leaving Columbia early in the summer, Dr. Ellis and field party proceeded to the Fort Worth (Tex.) Laboratory where particular attention was given to the catfish investigations in progress there. From Fort Worth the party proceeded to Uvalde, Tex., where a study of water conditions indicated the source of at least one of the difficulties hampering pond operations, not only at Uvalde but also throughout the Southwest. While in Texas, the party had an opportunity to make direct observations on the silt and salt loads of floodwaters, obtaining valuable data.

Studies of impounded waters continued at Elephant Butte Reservoir in cooperation with the United States Reclamation Service and the National Research Council, and at Lake Mead in cooperation with the same agencies and the National Park Service. At Elephant Butte opportunity was afforded to use a new piece of apparatus recently developed in the Columbia Laboratories by means of which direct determinations of silt, turbidity, water temperature, and light transmission were possible inch by inch throughout the entire depth of the lake. This new apparatus gave valuable detailed data confirming previous observations made by less accurate methods. Application of various new methods and pieces of apparatus to surveys of these western impounded waters is proving very profitable and is providing a wealth of new information on water problems which has not been available previously. A manuscript on Lake Mead is planned, comparable to the one on Elephant Butte now nearing completion.

After completing the work at Lake Mead the party proceeded to the geyser fields and the Hot Creek region in California where a large series of observations were made. At Gold Beach, Oreg., work carried on during the previous summer on the Rogue River mining problems was checked and extended.

In the Mount Rainier section studies of glacier waters were continued. In addition to making observations on the three major glacier fields, Nisqually, Puyallup, and Edmonds Glaciers, the party studied a large number of streams receiving glacier waters. After completing the work in the vicinity of Mount Rainier the field party moved over into the Columbia drainage and made extensive observations on the Columbia River and its tributaries above and below Rock Island Dam. These data form parts of series collected in previous years which it is believed will ultimately be of service in answering some of the questions concerning the establishment of new salmon runs in these streams.

Dr. Westfall, who carried on laboratory experiments at Columbia during the months of June and July, and looked after the field material as sent in, joined Dr. Ellis' party at Lake Mead the second week in August. Enroute to Lake Mead Dr. Westfall, with field truck and equipment, covered various streams in northern New Mexico and Arizona. Dr. Westfall remained with the main party from Lake Mead to Glacier Park, then proceeded east through Montana and North Dakota to check water conditions in the Fort Peck Dam area, the headwaters of the Missouri, and at Jamestown and Valley City, N. Dak., where proposed hatcheries are being considered. From North Dakota he proceeded east through Minnesota and made an investigation of the pollution situation on the Rainy River.

The main field party proceeded south from Glacier Park through the lead district of north Idaho and the copper district of Montana to check observations at regular stations, thence through Yellowstone Park and Wyoming, giving particular attention to streams from geyser fields or from heavily mineralized districts. Reaching the southern Wyoming line, the party was again split so that two sets of streams, one across Colorado and one across Nebraska, were sampled by the returning parties enroute to the Columbia (Mo.) station.

Because of improved apparatus and new methods used, summer field studies were much more detailed during 1938 than heretofore. Special apparatus was carried, by means of which physiological studies of the fish were made in the field. This innovation proved very successful and yielded not only valuable but also surprising data in many cases. It is well known that moving fish or other animals from their natural habitat, even under the most rigid precautions, frequently results in physiological changes so that the examination of these live animals in the laboratory often fails to give a true picture of their conditions in the field. With the special physiological and biochemical apparatus carried the physiological observations and tests were made immediately at the stream in which the fish were living. It is believed that these data will supply a much truer picture of the physiology of our fresh water fishes than has hitherto been available.

*Summary of progress during 1938.*—Studies of stream pollution during the past year have demonstrated more clearly than ever before the fact that high dilutions of many substances, introduced by man into streams, lakes, and reservoirs, or entering these waters from natural sources, have cumulative actions and seriously impair the vital activities of food and game fishes. By continued action these substances, even though they be present in the water in very small quantities, are often more insidious and far reaching in their effects on fish life than other more obvious pollutants which kill fish at once. Collectively, therefore, the pollution investigations determine the suitability of particular waters, both in the stream and in the hatchery, for various types of fishes, the detrimental actions of specific substances, and reliable means for measuring the condition of the fish themselves.

This year's work has shown, among other things, that very small quantities of arsenicals and several other materials introduced into or placed on waters as mosquito larvacides, impair the growth and nutrition of fishes in these waters in addition to building up serious hazards of lethal poisoning; that certain combinations of some of the less common minerals which are found in small quantities in various western streams are responsible for internal injuries to trout and other fishes in these waters, and that these internal conditions are correlated with decline in weight and finally with the death of the fish in such streams; and that small quantities of several inorganic salts quite widespread in southern and western waters are the cause of low productivity and on occasion of the sudden death of large numbers of fishes in fish hatcheries, streams, and reservoirs receiving such waters.

Because of these findings, and other similar studies in progress, the listing of streams throughout the United States which can be designated as unsuitable for fish plantings, or in which low productivity may be expected because of these biochemical factors, is in progress.

As impounded waters are particularly subject to concentration of the various minerals and other compounds which constitute natural hazards to fish and other aquatic life, the detailed chemical and biological studies which have been in progress for some time at Elephant Butte Reservoir, N. M., and Lake Mead, Nev., have been continued throughout the past year.

Acute pollution problems continue to claim considerable attention, and specific cases of paper-mill pollution have been studied in Florida, South Carolina, North Carolina, and Minnesota; of phosphate-mine pollution in Florida; of copper, lead, and zinc mining operations in Idaho, and Montana; of combined industrial pollution in New York and Mississippi; and of placer gold mining in Oregon. Reports on these investigations have been submitted or are now in preparation. This unit has continued to advise both public and private agencies on matters of pollution and water conditions, and many State officials, various industrial concerns, and numerous private individuals have been given specific answers to particular problems throughout the year.

## ICHTHYOLOGICAL INVESTIGATIONS

*Fishes of the Canal Zone and Panama.*—The study of specimens and data collected in 1935 and 1937 was continued by Dr. Samuel F. Hildebrand. The study of the fresh-water material was completed, and the results have been embodied in a publication entitled "A New Catalogue of the Fresh-Water Fishes of Panama." In this catalogue 127 species are listed, including 9 new ones. The origin and distribution of the fishes of the Isthmus of Panama are discussed, and considerable life-history data are given. A section is devoted to the successes and failures of introduced fishes, setting forth precautions that should be taken and outlining a plan for future introductions.

The study of specimens and data collected in the locks of the Panama Canal, as well as elsewhere in the Canal, was completed. A full report was prepared, listing the animals taken and containing special information on the use of the Canal, especially its locks, as passageways for fishes.

*American anchovies.*—The taxonomic revisional studies of the American anchovies by Dr. Hildebrand were continued, especially in connection with the work set forth in the preceding paragraph. The study of the Atlantic forms has been carried about as far as the material available will permit, but only a few of the Pacific coast species have been studied.

*Fishes of Tortugas, Fla.*—The editorial work and study of specimens necessary in completing and getting ready for publication an unfinished monograph on the fishes of Tortugas, Fla., left by the late Prof. William H. Longley, has been far advanced during the year by Dr. Hildebrand. The points of chief interest in this work are the underwater observations and photographs of the shallow-water fishes, and the numerous additions of West Indian fishes to the American fauna.

*General systematic studies.*—Revisional studies of the systematics of American fishes were continued by Isaac Ginsburg, with special reference to the Gobiidae. New species were described, based chiefly on material studied from the gobies obtained by Dr. Hildebrand in Panama; material submitted for study by the Bingham Oceanographic Foundation; and material from the Hancock Collection, Stanford University, and from the National Museum.

## INDEPENDENT ACTIVITIES OF THE FISHERIES BIOLOGICAL LABORATORIES

### WOODS HOLE, MASS.

Owing to the lack of a special appropriation, the Woods Hole station was opened last summer to only a limited number of investigators. In addition to Dr. Galtsoff, Acting Director, and his staff, who were engaged in shellfisheries studies, the following persons occupied laboratory space: Dr. H. M. Smith, Associate Curator in Zoology, United States National Museum, working on otoliths of local fishes and a report on fresh-water fishes of Siam; Dr. Edwin Linton, University of Pennsylvania, helminth parasites of fishes; Dr. Raymond W. Root, College of the City of New York; and Dr. Clark Black, of Swarthmore College, the effect of carbon dioxide upon the oxygen-combining power of marine fish blood; Dr. d'Alte A. Welch, Johns Hopkins University, the variations and distribution of Hawaiian tree snails; Milton J. Lobell, United States Bureau of Fisheries, age composition of the winter flounder population and general studies of the life history; Julian G. Griggs, George Washington University, fertility in the oyster under various conditions.

In September the laboratory sustained considerable damages from wind and a tidal wave which swept the grounds, flooding the basement of the hatchery and the residence and destroying the seawall and pier. No serious damage was done to the floating equipment or to the scientific apparatus.

### BEAUFORT, N. C.

Research facilities for the study of marine fishery problems in the South Atlantic region were provided throughout the year at the Beaufort Laboratory. The chief investigations conducted here by the Bureau's staff, under the direction of Dr. H. F. Prytherch, consisted of experiments and studies with reference to oyster culture; destruction of oysters by starfish; the propagation of diamond-back terrapin; the utilization of salt-marsh pools for propagation of fish and shellfish; and mortality of shellfish in Myrtle Sound, N. C.

Assistance and advice was given to the following agencies, as indicated, on matters pertaining to the marine fisheries and fishery industries of the South Atlantic region; United States Engineer Department, construction of new inlets in the vicinity of Cape Lookout for improvement of the fisheries of Core Sound, N. C.; North Carolina Department of Conservation and Development, continuation of oyster-planting programs and investigation of oyster mortality in Myrtle Sound; Duke University, construction of five building units and pier of biological laboratory on property adjacent to the Beaufort stations; Union Carbide and Carbon Corp., continuation of corrosion tests with stainless steel cable under marine conditions; Aluminum Company of America and the United States Navy, antifouling and corrosion tests on aluminum panels; Fordham University, Chemistry Department, tests of the antifouling value of special paints for marine use.

Laboratory facilities for biological research have been provided for 27 independent investigators from other institutions who were engaged in the following studies: Dr. H. V. Wilson, professor in the University of North Carolina, cellular reactions to drugs; Dr. A. S. Pearse, Duke University, assisted by James W. Littler and Henry A. Walker, polyclad worms and crustacean parasites; Dr. Frederick F. Ferguson, University of Virginia, the marine turbellaria; Dr. M. A. Stirwalt, University of Virginia, assisted by Frances C. Smith, morphology of marine rhabdocœles; Dr. George H. Girty, United States Geological Survey, the ecology of living mollusks; Dr. W. C. George, University of North Carolina, comparative hematology; Dr. Bert Cunningham, Duke University, effects of temperature on the rate of development of turtle eggs; Dr. Katherine R. Jeffers, Duke University, the effect of pituitary hormones on the ovaries of marine fishes; Dr. Arthur E. Woodhead, University of Illinois, trematode parasites of fish, especially larval forms in oysters; Dr. F. J. Brinley, North Dakota State College, physiological studies of fish embryos; Dr. William L. Engels, University of North Carolina, terrestrial vertebrate fauna of the coastal banks; A. B. Hardcastle and Margaret S. Hardcastle, a protozoan parasite of the menhaden; Sidney Shapiro, Columbia University, differential growth in the Scombroidei; Coit Coker, University of North Carolina, embryology of echinoderms; Roscoe E. Hill, University of Illinois, ecological studies of marine fauna; Nelson G. Hairston, University of North Carolina, development and reproduction in hydroids; Russell A. Huggins and Sara E. Huggins, Western Reserve University, the scale size of fish in relation to body size; Gordon H. Tucker, University of North Carolina, gonad development in ascidians; J. Albert Fincher, University of North Carolina, spermatogenesis in sponges; Stephen W. Gray, University of Illinois, physiology of the invertebrate heart; H. J. Lewis and Hervey Lewis, Narragansett Bay Oyster Co., spawning and larval development of oysters.

*Propagation of the diamond-back terrapin.*—A record hatch of 13,600 young diamond-back terrapins was obtained during the past summer at the United States Fisheries Biological Station at Beaufort, N. C., which operates the world's largest hatchery for the propagation of these salt-marsh turtles. The greatest annual production prior to this time was that obtained in 1935, when a brood of 13,245 was produced in the 5 concrete breeding pens surrounding the station. Artificial propagation of terrapin was first undertaken here in 1909, and since then has yielded over 128,000 young diamond-backs for restocking the coastal salt marshes of North Carolina and other Southern States. The 1938 brood has been placed in special hibernating boxes in the large rearing house and next spring will be distributed throughout the South Atlantic region in cooperation with the various State conservation departments.

This year's high production is attributed to improvements that were made in breeding pen arrangements as a result of experimental studies conducted under the direction of Dr. Prytherch and Capt. Charles Hatsel. Since these studies indicated that production of young might be considerably increased by allowing the brood stock greater room for feeding, egg laying, etc., two large pens were constructed to relieve the crowding of adult terrapin in the other five enclosures. In the new pens, in which the brood stock was allowed approximately twice as much space as during the previous year, the production of young by each group (consisting of 400 females and 100 males) increased from 1,200 and 2,480, respectively, in 1937 to 3,360 and 3,616 in 1938. In two other experiments, in which the number of adult terrapin per pen was reduced 50 percent, there were increases of 25 and 40 percent in production of young in 1938. In the various experimental pens in which crowding was reduced, the average production of young per female terrapin showed increases of 3.0 to 5.2; 3.0 to 8.41; 6.2 to 8.4; and 8.0 to 10.1, as compared with the previous year. A most encouraging aspect of these improvements in terrapin propagation is that general conditions in 1938 were apparently less favorable for breeding than usual, as two of the "control" pens that were not changed in any respect showed decreases in egg production of 20 and 50 percent.

The total brood stock at present consists of 570 males and 2,025 females, most of which have been in captivity for periods ranging from 10 to 25 years. Last season 320 wild terrapin were added to this stock and are being kept under observation in a separate pen to determine the length of time required to reach satisfactory egg production. During the first summer these terrapin produced only a few young but showed an increased output of 460 for 1938. In experiments conducted in cooperation with Dr. Bert Cunningham, of Duke University, several hundred eggs were successfully incubated under artificial laboratory conditions by keeping them in holders of moist filter paper instead of in a layer of sand, as in nature. This new technique will be valuable in future experiments to determine the relative importance of various environmental factors such as temperature, humidity, oxygen supply, etc., on the rate of incubation and survival of young of the diamond-back terrapin.

*Utilization of salt-marsh ponds for propagation of fish and shellfish.*—Investigations have been undertaken to determine the possibility of using improved marsh areas in the South Atlantic coastal region for breeding and growing mullet, oysters, and other marine species of commercial importance. In cooperation with the Works Progress Administration the construction of a large tidal pond, 2½ acres in extent, for experimental rearing of mullet was completed by the fall of 1938. This was stocked with over 3,000 fish ranging in size from roe mullet, weighing over 5 pounds, to immature fish having a length of 6 to 8 inches and which are approximately 1 year old. Less than 1 percent of the fish died from injuries sustained during collection and transportation to the pond by live car. The tidal circulation renews over half the water in the pond every 12 hours and apparently has maintained, during the first 3 months of operation, satisfactory conditions for breeding and feeding of the mullet. This is indicated by the discovery of thousands of very young mullet in the pond during the latter part of December which had attained lengths ranging from one-half to three-fourths of an inch. Representative samples of these small mullet are being collected at intervals of 1 month in order to obtain a record of their rate of growth in this experimental area. Observations are also being made of the growth of the large mullet and the time required for the various age groups or schools to reach marketable size. The experiments thus far have shown that tidal ponds of this type can also be used for the temporary storage of comparatively large quantities of live fish until conditions for marketing are most suitable.

Construction operations were continued on marshland adjacent to the mullet-rearing pond to provide shallow canals and small ponds for experiments in oyster culture. These were planted in the early fall with several hundred bushels of seed oysters gathered from nearby beds where overcrowding produces an inferior quality of oyster. In the artificial ponds the oysters have shown rapid growth during the first 3 months, October through December, but the real test as to the practical value of this procedure will come during the summer of 1939, when arrangements will be put into effect to protect these plantings from attachment of spawn and subsequent crowding. Detailed observations of the rate of growth of the seed oysters in weight, volume, etc., are being made by the use of cement panels to which representative groups of oysters have been fastened, in order that individual measurements may be obtained at regular intervals. Different conditions are being maintained and studied in the various ponds with respect to temperature, depth, and circulation of water in relation to the density of oyster plantings and time required for the seed to reach marketable size.

## APPROPRIATIONS

The funds for the work of the Division of Scientific Inquiry in the calendar year 1938 were approximately the same as for 1937 insofar as the basic appropriation is concerned. The lifting of the requirement for administrative saving, however, made available $30,000 which was held in reserve the previous year. The sum of $76,000 was added to the appropriation in order to finance the new Bristol Bay salmon investigation. An appropriation specifically for conserving fish by screens and ladders was provided in the amount of $20,000. By means of special deposit funds made available by the States of Virginia and Maine, investigations were conducted on the oyster and lobster fisheries, respectively. Large allotments of Public Works Administration and Works Progress Administration funds made possible the construction projects undertaken by the Division to improve the biological stations at Milford, Conn., Beaufort, N. C., and Pensacola, Fla., as well as to construct fish screens in the States of Washington, Oregon, and Idaho. In addition to these projects statistical work on old fishery records was conducted at Cambridge, Mass., Ann Arbor, Mich., and Stanford University, Calif. About one-third of the emergency funds and about one-half of the two regular appropriations was spent in the calendar year 1938. A statement of funds available for biological investigations is given below:

| Project | 1938 | 1939 |
|---|---|---|
| Regular appropriations: | | |
| Commercial fishery investigations | $133, 181 | $222, 300 |
| Oyster cultural investigations | 50, 579 | 50, 620 |
| Aquiculture investigations | 42, 500 | 46, 880 |
| Conserving fish by screens and ladders | 1, 500 | 20, 000 |
| Water quality studies | ---------- | 11, 100 |
| Washington laboratory and administration | 4, 240 | 7, 100 |
| Total | 232, 000 | 358, 000 |
| Allotment for travelling expenses | 27, 000 | 31, 620 |
| Allotment for maintenance and operation of vessels | 29, 000 | 30, 450 |
| Special funds: | | |
| Marine fouling studies | 1, 500 | ---------- |
| State of Virginia oyster fund | ---------- | 5, 000 |
| State of Maine lobster fund | ---------- | 2, 500 |
| Public Works Administration projects | ---------- | 281, 050 |
| Works Progress Administration projects | ---------- | 127, 645 |

U. S. DEPARTMENT OF COMMERCE
HARRY L. HOPKINS, Secretary
BUREAU OF FISHERIES
CHARLES E. JACKSON, Acting Commissioner

Administrative Report No. 36

# ALASKA FISHERY AND FUR-SEAL INDUSTRIES IN 1938

By WARD T. BOWER

APPENDIX II TO REPORT OF COMMISSIONER OF FISHERIES
FOR THE FISCAL YEAR 1939

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## ADMINISTRATIVE REPORT SERIES

Since the beginning of the Administrative Report Series, considerable confusion has arisen concerning the system of numbering the separates composing it. Inasmuch as the Reports of the Divisions vary in order from year to year, many have found their designations as "Appendix No. I, II, III, or IV" very confusing. To relieve this, it has been decided to number them as "Administrative Report No. —." Inasmuch as 20 separates had already been printed in this series before starting the numbers, it was deemed advisable to begin the numbering with Administrative Report No. 21. Of course, numbers cannot be printed on those already off the press, but for the information of those who wish to know what the first 25 were, they are numbered for filing purposes as follows:

No. 1. Report, Commissioner of Fisheries, 1931.
No. 2. Alaska Fishery and Fur-Seal Industries, 1930.
No. 3. Fishery Industries of the United States, 1930.
No. 4. Progress in Biological Inquiries, 1930.
No. 5. Propagation and Distribution of Food Fishes, 1931.
No. 6. Report, Commissioner of Fisheries, 1932.
No. 7. Alaska Fishery and Fur-Seal Industries, 1931.
No. 8. Fishery Industries of the United States, 1931.
No. 9. Progress in Biological Inquiries, 1931.
No. 10. Propagation and Distribution of Food Fishes, 1932.
No. 11. Alaska Fishery and Fur-Seal Industries, 1932.
No. 12. Progress in Biological Inquiries, 1932.
No. 13. Fishery Industries of the United States, 1932.
No. 14. Propagation and Distribution of Food Fishes, 1933.
No. 15. Fishery Industries of the United States, 1933.
No. 16. Alaska Fishery and Fur-Seal Industries, 1933.
No. 17. Progress in Biological Inquiries, 1933.
No. 18. Propagation and Distribution of Food Fishes, 1934.
No. 19. Alaska Fishery and Fur-Seal Industries, 1934.
No. 20. Fishery Industries of the United States, 1934.
No. 21. Progress in Biological Inquiries, 1934.
No. 22. Propagation and Distribution of Food Fishes, 1935.
No. 23. Alaska Fishery and Fur-Seal Industries, 1935.
No. 24. Fishery Industries of the United States, 1935.
No. 25. Propagation and Distribution of Food Fishes, 1936.

Note that the last Commissioner's Report was for 1932. Since then its place has been taken by a reprint from the Report of the Secretary of Commerce under the title "Bureau of Fisheries." Inasmuch as it is no longer a Bureau publication, it is not numbered; but it will be supplied to any who request the Report of the Commissioner for any year since 1932.

# ALASKA FISHERY AND FUR-SEAL INDUSTRIES IN 1938[1]

By WARD T. BOWER, *Chief, Division of Alaska Fisheries*

## CONTENTS

Page
- INTRODUCTION 85
  - Visit of Commissioner of Fisheries and other officials to Alaska 86
  - Japanese vessels in Bering Sea 87
- FISHERY INDUSTRIES 87
  - Alaska fisheries legislation 88
  - New fishery regulations 89
  - Annette Island Fishery Reserve 91
  - Oyster cultivation 92
  - Stream improvement 93
  - Control of predatory trout 93
  - Oil drilling in Bristol Bay area 93
  - Stream marking 94
  - Stream guards 94
  - Vessel patrol 95
  - Aerial patrol 96
  - Complaints and prosecutions 96
  - Territorial license tax 101
  - Kuskokwim River 101
  - Yukon River 102
  - Weirs for counting salmon escapement 103
    - Alitak Bay 103
    - Chignik River 104
    - Chinik Creek 104
    - English Bay 104
    - Fish Creek 104
    - Kalgin Island Creek 105
    - Karluk River 105
    - Klawak Creek 105
    - Little Port Walter 106
    - Orzenoi River 106
    - Red River 106
    - Situk River 106
  - Salmon tagging 107
  - Salmon life-history studies 107
  - Observations on the escapement of salmon 108
  - General statistics of the fisheries 111
  - Salmon 114
    - Catch and apparatus 114
    - Canning 122
      - Changes in canneries 122
      - New canneries 123
      - Canneries not operated 123
      - Total canneries operated 125
      - Losses and disasters 126
      - Statistics 127
      - Pack in certain districts 131
    - Mild curing 133
    - Pickling 134
    - Fresh salmon 135
    - Freezing 136
    - Dry-salted, dried, and other miscellaneous salmon products 136
    - Byproducts 137

FISHERY INDUSTRIES—Continued.

Page
  - Herring 137
    - Statistical summary 139
  - Halibut 140
    - Statistical summary 140
  - Cod 141
  - Whales 142
  - Clams 143
  - Shrimp 144
  - Crabs 144
  - Trout 145
  - Miscellaneous fishery products 146
- FUR-SEAL INDUSTRY 146
  - Pribilof Islands 146
    - General administrative work 146
    - Transportation of supplies 147
    - Power vessel *Penguin* 147
    - Roads 148
    - Buildings 148
    - Byproducts plant 148
    - Natives 149
      - Census 149
      - Medical service 149
      - Schools 149
      - Savings accounts 150
      - Payments for taking fur-seal skins 150
      - Payments for taking fox skins 151
    - Fur seals 151
      - Killings 151
      - Age classes 152
      - Computation of fur-seal herd 153
    - Foxes 154
      - Trapping season of 1938–39 154
    - Reindeer 154
  - Fur-seal skins 154
    - Shipments 154
    - Sales 155
    - Disposition of fur-seal skins taken on Pribilof Islands 158
  - Shipment and sale of fox skins 159
  - Fur-seal patrol 159
    - United States Coast Guard 159
    - Bureau of Fisheries 160
  - Sealing privileges accorded aborigines 160
  - Japanese sealskins delivered to the United States 161
  - Substation for sea-otter patrol 161
- COMPUTATION OF FUR SEALS, PRIBILOF ISLANDS, 1938 161
  - Bulls 162
  - Average harem 164
  - Pups and cows 165
  - Mortality of seals at sea 166
  - Complete computation 166

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[1] Administrative Report No. 36, Appendix II to the Report of the U. S. Commissioner of Fisheries for 1939. Approved for publication June 24, 1939.

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# INTRODUCTION

The Bureau's work in Alaska, which pertains primarily to fishery and fur-seal management, was continued in accordance with the usual plan. The Commissioner of Fisheries spent several weeks in the Territory in July, inspecting both branches of the service.

Regulations for the protection of the fisheries were revised early in the year to meet conservation requirements in various localities, and few additional restrictions were necessary during the progress of the season. In certain places where the salmon runs were late and sufficiently large to assure more than an ample escapement for seeding purposes, the regulations were relaxed to permit from 1 to 4 days additional fishing. Although somewhat below the record output for 1936, the yield of salmon in Alaska in 1938 was well above average.

Weirs for counting the escapement of brood fish were operated in 11 representative salmon streams as a means of determining the ratio of escape to catch. Observations were made also of the numbers of breeding salmon in various important streams where no weirs were maintained.

Under the authorization granted by the Act of August 2, 1937, for the protection of oyster culture in Alaska, two applications were made for lease of bottoms in Territorial waters of southeast Alaska for the bona fide cultivation of oysters. The leasing of such bottoms is on liberal terms, with a view to encouraging the development of this industry.

A patrol of the fishing grounds was maintained by the Bureau's 14 vessels, 5 speed boats, and 14 other small power boats, supplemented by a number of chartered boats and launches. Some use was made also of chartered airplane service, both for patrol and for investigational work. There were 134 persons employed for varying periods as stream guards and special workmen in connection with the enforcement of the fishery laws and regulations, in addition to the regular personnel of approximately 60 persons, principally wardens and vessel operators.

Incidental to fishery-patrol duties, attention was given to the clearing of salmon streams in order to make additional spawning areas accessible for seeding. The improvement of conditions for the natural propagation of salmon involved also the destruction of predatory trout that feed upon salmon eggs and fry. This work was carried on chiefly in the Bristol Bay and Cook Inlet regions, through funds contributed by the Territorial legislature and the salmon packers.

Biological studies of salmon, herring, and trout were continued. The studies of the salmon this season were extended to include a comprehensive investigation of the red salmon of the Bristol Bay area.

No change was made in the regulations for the protection of walruses and sea lions.

There were 58,364 fur-seal skins taken on the Pribilof Islands, an increase of 3,184 over the number obtained in the preceding year. Computations of the fur-seal herd as of August 10, 1938, showed a total of 1,872,438 animals, as compared with 1,839,119 in 1937. Killings were from surplus male seals, chiefly 3-year-olds, provision being made for a sufficient breeding reserve. The feeding and management of blue foxes on the islands were continued. During the 1938–39 season 1,029 fox pelts were obtained, and a suitable number of animals were marked and reserved for breeding stock.

The operation of the byproducts plant at St. Paul Island for the utilization of fur-seal carcasses resulted in an output of 30,587 gallons of oil and 178½ tons of meal. Except for limited quantities retained at the islands, these products were shipped to Seattle, where the oil was sold for commercial purposes, and the meal was turned over to the Division of Fish Culture for use as fish food at the hatcheries.

A few additional buildings for the natives and the fur-seal industry were constructed at the Pribilof Islands, and improved roads between the curing stations and hauling grounds were repaired and extended. Some new structures and equipment were added to the substation for sea-otter patrol in the western Aleutians.

Through the courtesy of the Navy Department the U. S. S. *Vega* transported the annual shipment of supplies from Seattle to the Pribilof Islands and brought out the season's take of fur-seal skins on the return trip. The Coast Guard again rendered valuable assistance in maintaining a patrol for the protection of the fur-seal herd and in performing other service.

Acknowledgment is made of the assistance by members of the Bureau's staff in the preparation of this document.

## VISIT OF COMMISSIONER OF FISHERIES AND OTHER OFFICIALS TO ALASKA

The Commissioner of Fisheries sailed from Seattle aboard the *Brant* on July 2 to inspect the Bureau's fishery and fur-seal activities in Alaska. The party accompanying the Commissioner on this trip included Congressman Millard F. Caldwell, member of the House Appropriations Committee, Dr. Ernest H. Gruening, Director, Division of Territories and Island Possessions, and Mr. John B. McColl, chairman of the fisheries committee of the California State Senate.

The Commissioner's party arrived at Cordova on July 9, after stopping en route at various points in southeast Alaska. From Cordova the trip was continued by airplane to Anchorage and the Matanuska colony and thence to Naknek. At this point the party boarded the Coast Guard cutter *Ingham* and proceeded to St. Paul and St. George Islands to observe the fur-sealing operations there. The Commissioner had planned to return to Seattle aboard the *Brant*, following his visit to the Pribilof Islands, but owing to an accident to that vessel at Kodiak on July 15, the Commissioner's party completed the return trip on the *Ingham*, arriving in Seattle on July 22.

Ward T. Bower, Chief of the Division of Alaska Fisheries, represented the Department on the special fisheries cruise of the Coast Guard cutter *Ingham*, sailing from Seattle on June 24 and returning on July 22. Calls were made at many of the fishing centers and at several Bureau stations en route to Bristol Bay and return. Senator Robert R. Reynolds, of North Carolina, was to have made the trip aboard the *Ingham* but was unable to leave Washington at that time.

Later in the summer, however, Senator Reynolds proceeded to Alaska, and called at St. Paul Island when the Coast Guard cutter *Northland* stopped there on July 28.

Seton H. Thompson, Assistant Chief of the Division of Alaska Fisheries, departed from Seattle aboard the *Penguin* on June 11 to study the fur-seal industry at the Pribilof Islands and to inspect the Bureau's fisheries activities in other sections of Alaska. Following extensive observations at St. Paul Island, Mr. Thompson paid particular attention to the fisheries of Bristol Bay, Cook Inlet, and Prince William Sound before returning to Seattle on August 14 aboard the *Penguin*. Harold B. Carr, Editor and Photographer of the Bureau, accompanied Mr. Thompson to St. Paul Island to obtain official pictures of fur-sealing operations. He returned to Seattle with the Commissioner's party aboard the *Ingham*.

### JAPANESE VESSELS IN BERING SEA

In the spring of 1938 assurances were given by the Japanese Government that it would suspend the official survey of salmon resources in the waters of Bristol Bay which it had begun 2 years previously, and that it would continue to suspend the issuance of licenses for vessels to fish for salmon in those waters. This disposition of the matter was arranged after prolonged diplomatic negotiations between the countries involved, inasmuch as the expansion of Japanese activities with respect to the salmon fishery had alarmed Bristol Bay packers, and strong protests had been made against the threatened encroachment on Alaska salmon fisheries.

Only one Japanese crab cannery, the *Toten Maru* (2,951 tons), was operated in Bristol Bay in 1938. It was accompanied by 3 50-foot trawlers and 10 launches about 30 feet long, and left the district before the salmon runs began. Thus there was no interference with the salmon fishery in this region.

The scouting ship *Hakuho Maru*, of the Department of Agriculture and Forestry, cruised in the vicinity of the Aleutian Islands the latter part of May for the purpose of investigating the migration route of fur seals. The vessel was reported as having arrived at Atka from the westward on May 29 and departed for Japan on June 1, owing to engine trouble.

## FISHERY INDUSTRIES

As in corresponding reports for previous years, the Territory of Alaska is here considered in the three coastal geographic sections generally recognized, as follows: (1) Southeast Alaska—embracing all that narrow strip of mainland and the numerous adjacent islands from Portland Canal northwestward to and including Yakutat Bay; (2) central Alaska—the region on the Pacific from Yakutat Bay westward, including Prince William Sound, Cook Inlet, and the southern coast of Alaska Peninsula, to Unimak Pass; and (3) western Alaska—the north shore of the Alaska Peninsula, including the Aleutian Islands westward from Unimak Pass, Bristol Bay, and the Kuskokwim and Yukon Rivers. These divisions are solely for statistical purposes and do not coincide with areas established in departmental regulations.

Detailed reports and statistical tables dealing with the various fishery industries are presented herewith, and there are also given the important features of certain subjects of special investigation or inquiry.

## ALASKA FISHERIES LEGISLATION

Under date of April 7, 1938, the President approved an act amending the Act of August 14, 1937, which prohibited commercial salmon fishing by means of stake or set nets in the Bristol Bay area except by persons having resided continuously for a period of at least 5 years within a radius of 30 miles of the place of set-netting. The new act permits such fishing by persons residing continuously within the said area for a period of 2 years and, in the 1938 season, by persons residing there continuously after June 1, 1937.

The Act of June 14, 1906, entitled "An act to prevent aliens from fishing in the waters of Alaska," was amended by an act approved by the President on June 25, 1938, whereby all fishing in Alaska is limited to citizens of the United States, or to persons owing allegiance thereto, and to certain residents of the Territory. Under this act only the following persons may fish in the waters of Alaska:

1. Citizens of the United States.
2. Bona fide residents of the United States who have declared their intention to become citizens of the United States.
3. Natives of Alaska.
4. Aliens owing allegiance to the United States, i. e., Filipinos.
5. Bona fide residents of Alaska who have been residents for a period of three consecutive years prior to June 25, 1938, and who since June 25, 1935, have been continuously or seasonally engaged in commercial fishing in Alaskan waters. Aliens in this category, however, may continue to fish only until June 25, 1941, unless in the meantime they declare their intention to become citizens of the United States.

The text of the amendments is as follows:

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That Public Law Numbered 282, Seventy-fifth Congress, entitled "An Act making further provision for the fisheries of Alaska," approved August 14, 1937 (50 Stat. 639), is amended to read as follows: "That section 1 of the Act approved June 6, 1924, entitled 'An Act for the protection of the fisheries of Alaska, and for other purposes' (43 Stat. 464), as amended, is further amended by inserting in said section at the end of the first proviso thereof another proviso to read as follows: '*Provided further*, That in the area embracing Bristol Bay and the arms and tributaries thereof, no person shall at any time fish for or take salmon with a stake net or set net, for commercial purposes, unless such person shall be a citizen of the United States and shall have theretofore continuously resided for the period of at least two years within said area; but for the salmon fishing season of 1938, residence within said area continuously after June 1, 1937, shall be deemed sufficient compliance with the residence requirements of this proviso:' "

Approved, April 7, 1938.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That section 1 of the Act of Congress approved June 14, 1906 (34 Stat. 263), entitled "An Act to prevent aliens from fishing in the waters of Alaska", is amended to read as follows:

"That it shall be unlawful for any person not a citizen of the United States, or who has declared his intention to become a citizen of the United States, and is not a bona fide resident therein, or for any company, corporation, or association not organized or authorized to transact business under the laws of any State, Territory, or district thereof, or for any person not a native of Alaska, to catch or kill, or attempt to catch or kill, except with rod, spear, or gaff, any fish of any kind or species whatsoever in any of the waters of Alaska under the jurisdiction of the United States: *Provided, however*, That nothing contained in this Act shall prevent those lawfully taking fish in the said waters from selling the same, fresh or cured, in Alaska or in Alaskan waters, to any alien person, company, or vessel then being lawfully in said waters: *Provided further*, That nothing contained in this Act shall prevent any person, firm, corporation, or association lawfully entitled to fish in the waters of Alaska from employing as laborers any aliens who can now be lawfully employed under the existing laws of the United States, either at stated wages or by piecework, or both, in connection with the canning, salting, or otherwise preserving of fish: *Provided further*, That any person owing allegiance to the United States shall not be considered an alien for the purpose of this Act: *And provided further*, That any person who is a bona fide resident of Alaska and has been such a resident for the period of three consecutive years prior to the date of approval of this Act, and who during such three-year period has been continuously or seasonally engaged in fishing in the waters of Alaska for commercial purposes, may continue to engage in fishing in the waters of Alaska for commercial purposes for the period of three years after the date of the approval of this Act, although not a citizen of the United States."

Approved, June 25, 1938.

## NEW FISHERY REGULATIONS

The regulations for the protection of the fisheries of Alaska, issued February 15, 1938, were amended by the following regulations issued by the Secretary of Commerce under the dates indicated:

[*April 27, 1938*]

### SOUTHEASTERN ALASKA AREA

#### SUMNER STRAIT DISTRICT

*Salmon fishery.*—1. Regulation No. 15 (d) is amended to read as follows: Kosciusko Island: West coast within 1,500 feet of a point at 55 degrees 55 minutes 56 seconds north latitude, 133 degrees 48 minutes 22 seconds west longitude.

2. Regulation No. 15 (m) is amended to read as follows: (1) Prince of Wales Island: North coast within 3,000 feet westerly of Point Colpoys; and (2) within 1,500 feet of a point on an unnamed island at the entrance to Port Protection, at 56 degrees 26 minutes 41 seconds north latitude, 133 degrees 38 minutes 4 seconds west longitude.

[*June 7, 1938*]

### KODIAK AREA

*Herring fishery.*—Regulation No. 3 prohibiting commercial fishing for herring from 6 o'clock antemeridian of Saturday of each week until 6 o'clock postmeridian of the Sunday following is rescinded.

### PRINCE WILLIAM SOUND AREA

*Herring fishery.*—Regulation No. 2 prohibiting commercial fishing for herring from 6 o'clock antemeridian of Saturday of each week until 6 o'clock postmeridian of the Sunday following is rescinded.

### SOUTHEASTERN ALASKA AREA

#### SUMNER STRAIT DISTRICT

*Salmon fishery.*—Regulation No. 2 (2) of supplement No. 251–24–1 issued on April 27, 1938, is amended to read as follows: Within 1,500 feet of a point on an unnamed island at the entrance to Port Protection, at 56 degrees 20 minutes 41 seconds north latitude, 133 degrees 38 minutes 4 seconds west longitude.

#### CLARENCE STRAIT DISTRICT

*Salmon fishery.*—Regulation No. 15 (m) (3) is amended to read as follows: The Bronaugh Islands south of 55 degrees 7 minutes 10 seconds north latitude and west of 131 degrees 43 minutes 30 seconds west longitude.

[*July 21, 1938*]

### BRISTOL BAY AREA

*Salmon fishery.*—Regulation No. 13 is amended to read as follows: Commercial fishing for salmon in the Ugashik district with nets less than 8½ inches stretched measure between knots is prohibited except in the period from 6 o'clock antemeridian June 30 to 6 o'clock antemeridian August 1.

[*August 4, 1938*]

### PRINCE WILLIAM SOUND AREA

*Salmon fishery.*—Regulation No. 10 is amended to read as follows: Commercial fishing for salmon is prohibited during the remainder of each calendar year after 6 o'clock postmeridian August 9: *Provided*, That this prohibition shall not apply (a) to trolling and gill netting through August 22 in the waters along the western coast from the outer point on the north shore of Granite Bay (known as Granite Bay Point) to the light on the south shore of the entrance to Port Nellie Juan, and (b) to trolling in the period from 6 o'clock antemeridian August 9 to 6 o'clock postmeridian September 20 in the waters of Prince William Sound east of 147 degrees west longitude, exclusive of all waters of Valdez Arm north of Point Freemantle. All trap leads from shore to entrance of hearts must be removed prior to 6 o'clock antemeridian August 13.

[*August 15, 1938*]

### SOUTHEASTERN ALASKA AREA

#### EASTERN AND WESTERN DISTRICTS

*Salmon fishery.*—Alaska general regulation No. 1 is hereby amended so as to permit the holding of salmon in traps in the Eastern and Western districts of the Southeastern Alaska area 72 hours after the termination of the fishing season.

[*August 18, 1938*]

### SOUTHEASTERN ALASKA AREA

#### EASTERN DISTRICT

*Salmon fishery.*—Regulation No. 7 is amended so as to permit commercial fishing for salmon north of 57 degrees north latitude until 6 o'clock postmeridian August 20.

#### SOUTHERN DISTRICT

*Salmon fishery.*—Regulations No. 6 and No. 7 are amended so as to permit commercial fishing for salmon until 6 o'clock postmeridian August 20.

[*August 19, 1938*]

### SOUTHEASTERN ALASKA AREA

#### WESTERN DISTRICT

*Salmon fishery.*—Regulations No. 8 and No. 9 are amended so as to permit commercial fishing for salmon south of 58 degrees north latitude from 6 o'clock postmeridian August 19 to 6 o'clock postmeridian August 20.

[*August 23, 1938*]

### SOUTHEASTERN ALASKA AREA

#### CLARENCE STRAIT DISTRICT

*Salmon fishery.*—Regulations No. 8 and No. 9 are amended so as to permit commercial fishing for salmon south of a line extending from Approach Point to Caamano Point from 6 o'clock postmeridian August 23 to 6 o'clock postmeridian August 25.

[*August 25, 1938*]

### Southeastern Alaska Area

#### CLARENCE STRAIT DISTRICT

*Salmon fishery.*—Regulation No. 7 is amended so as to permit commercial fishing for salmon between a line extending from Narrow Point to Ernest Point and a line extending from Approach Point to Caamano Point, from 6 o'clock postmeridian August 25 to 6 o'clock postmeridian August 27.

[*August 27, 1938*]

### Southeastern Alaska Area

#### CLARENCE STRAIT DISTRICT

*Salmon fishery.*—Regulation No. 7, as amended by supplementary regulation No. 251–24–9, is hereby further amended so as to permit commercial fishing for salmon between a line extending from Narrow Point to Ernest Point and a line extending from Approach Point to Caamano Point, from 6 o'clock antemeridian August 29 to 6 o'clock postmeridian August 30.

[*August 29, 1938*]

### Southeastern Alaska Area

#### CLARENCE STRAIT DISTRICT

*Salmon fishery.*—Regulation No. 6 is hereby amended so as to permit commercial fishing for salmon north of a line extending from Narrow Point to Ernest Point from 6 o'clock postmeridian August 29 to 6 o'clock postmeridian August 31.

[*August 30, 1938*]

### Southeastern Alaska Area

#### SOUTH PRINCE OF WALES ISLAND DISTRICT

*Salmon fishery.*—1. Regulations No. 6 and No. 7 are hereby amended so as to permit commercial fishing for salmon from 6 o'clock antemeridian August 31 to 6 o'clock postmeridian September 2.

2. Alaska general regulation No. 1 is hereby amended so as to permit the holding of salmon in traps in the South Prince of Wales Island district 72 hours after the termination of the fishing season.

[*September 8, 1938*]

### Southeastern Alaska Area

#### SUMNER STRAIT DISTRICT

*Salmon fishery.*—Regulation No. 6 is amended so as to permit commercial fishing for salmon by means of gill nets and beach seines in Wrangell Narrows, exclusive of all waters within one statute mile of the mouth of Petersburg Creek, from 6 o'clock antemeridian September 12 to 6 o'clock postmeridian September 30.

[*September 26, 1938*]

### Kodiak Area

*Salmon fishery.*—Regulation No. 11 is amended so as to permit commercial fishing for salmon between Old Harbor and Kodiak in the period from 6 o'clock antemeridian October 1 to 6 o'clock postmeridian October 15.

## ANNETTE ISLAND FISHERY RESERVE

The lease of the fishing and canning privileges of the Annette Island Fishery Reserve by the Annette Island Canning Co. under contract dated April 4, 1933, expired on April 3, 1938. The cannery was again offered to competitive bidders, new proposals being opened on December 15, 1937.

On February 10, 1938, the Assistant Secretary of the Interior, on behalf of the inhabitants of the reserve, entered into a new contract, effective April 4, 1938, with the Annette Island Canning Co. for the lease of the cannery for 5 years. Under the terms of this contract the Indians are to receive 76 percent of the net profits from the operation of said cannery, and the company 24 percent. The contract provides for a minimum guarantee of $25,000 to the Indians, regardless of whether or not their share of the profits amounts to that figure, except that this provision shall not be effective if the cannery cannot operate because of strikes, lockouts, or stoppage of labor, or from any other cause legitimately beyond the control of the company, or by reason of action by the Government. There is, however, an unconditional guarantee of $10,000 to be paid to the lessors, regardless of the net profits during any year in which the $25,000 guarantee is ineffective due to the above-mentioned causes.

The contract also provides that not to exceed 20 percent of the net profits may be expended by the lessee each year for additions, betterment, and improvement of the cannery, subject to the approval of the Council of the Annette Island Reserve, such expenditures to be repaid to the lessee from the portion of profits accruing to the Indians from the cannery operations.

In 1938 the company operated eight traps within the reservation the catch of which totaled 1,607,595 salmon, and 35,130 salmon taken in purse seines and gill nets were purchased from the natives. In addition, 1,252,705 salmon were purchased from independent operators of traps and seines outside the reserve. Of the total number of fish obtained, 137,370 were sold to other canneries, and the remainder were packed at the company's plant. In the operation of the cannery and of the fish traps employment was given to 69 whites and 368 natives.

Profits to the Metlakatlan Indians of the reserve on the cannery operations for 1937, under the provisions of the lease then in effect, amounted to $79,024.41. Preliminary estimates for the year 1938 under the new lease place the figure at about $63,500.

## OYSTER CULTIVATION

Under the authority conferred by the act of August 2, 1937, amending the Fisheries Act of June 6, 1924, with the object of lending appropriate encouragement to the development of oyster culture in Alaska, a 15-year lease, effective July 1, 1938, covering about 100 acres of tide flats in Shoal Cove, Carroll Inlet, southeast Alaska, was executed by the Assistant Secretary of Commerce in favor of William W. Whitcher, of Ketchikan, for the bona fide cultivation of oysters for commercial purposes. This was the first lease of bottoms in Territorial waters under the provisions of the above-mentioned act. A nominal charge is made for such leases, the consideration being at the rate of 10 cents per acre annually.

Application for another lease of oyster bottoms in Alaska was received in December, and a lease was subsequently executed, effective January 1, 1939, covering 75 acres of tidelands in certain waters of George Inlet, Carroll Inlet, Blank Inlet, and Pond Bay, in southeast Alaska, in favor of Celia Fairbanks and Jud Conkle, of Ketchikan.

Beginning in 1931, considerable experimental work has been done in Alaska to determine whether seed oysters may be grown, and the results obtained give fair promise that an industry to supply the local market may be developed.

## STREAM IMPROVEMENT

The improvement of salmon spawning streams in Alaska in 1938 was limited, for the most part, to that carried on by stream watchmen in connection with their regular patrol duties, although in the Cook Inlet area some stream-clearing work was accomplished under an allotment of Territorial funds available for this purpose as well as for bounty on predatory trout. The work consisted chiefly in clearing out log jams and other obstructions that hindered the passage of salmon to the spawning grounds. In the removal of obstructions, care is exercised to avoid accelerating the current so as to cause destruction of gravel bottoms used as spawning areas.

In the Kaflia Bay stream, where salmon were having difficulty in ascending long stretches of swift shallow water, construction of additional pools at intervals was undertaken by the Bureau to break the force of the current and facilitate the progress of the salmon upstream.

Increasing numbers of beaver, especially in parts of the Kodiak and Cook Inlet areas, present an important conservation problem. Where necessary, beaver dams have been opened to allow the salmon to ascend to the spawning beds. It is evident, however, that such measures are but temporary, and it is thought that a satisfactory solution to the problem can be found only after due investigation of the potential value of the two natural resources.

## CONTROL OF PREDATORY TROUT

The destruction of trout that feed upon salmon eggs and fry has been carried on for a number of years in the Bristol Bay region through funds derived from the Territory and the Bristol Bay packers, the expense being shared equally. Not only has this work resulted in a marked improvement in the runs of red salmon in the region, but it is of material benefit in providing a means of livelihood to residents by furnishing them profitable employment during the winter months. During the year 1938 approximately $17,000 was expended in the Bristol Bay region for bounty on Dolly Varden trout at the rate of 2½ cents per fish.

In the Cook Inlet area, also, stream improvement and predator-control work have been accomplished through an allotment from the Territorial appropriation and contributions of salmon packers. For the years 1937 and 1938 the sum of $5,000 was available for this work. In the destruction of predatory trout, efforts were confined to the Kasilof River and English Bay and Kalgin Island streams in order to determine what the possibilities might be. A bounty of 2½ cents each was paid, as in the Bristol Bay region. Less than 10,000 trout tails taken in the Cook Inlet district were vouchered in the summer of 1937, and the number in 1938 to August 26 was 36,388.

Trout traps for the catching of Dolly Varden trout were operated in connection with the four salmon-counting weirs on Kodiak Island. The number of trout taken in these traps was as follows: 51,385 in Karluk River, 54,317 in Red River, and 17,000 in Olga Bay streams.

Scientific studies of Dolly Varden trout in the Kodiak area were continued.

## OIL DRILLING IN BRISTOL BAY AREA

Observations were made by Bureau employees of experimental oil-drilling operations in 1938 at the headwaters of Salmon Creek, tributary to Becharof Lake of the Egegik River system, and the measures that were taken to prevent stream pollution which might impair valuable salmon runs.

These drilling operations were carried on by an association of the Standard, Union, and Associated Oil Companies. During the progress of drilling in July, a pocket of salt water was encountered at a depth of 500 feet. The pressure in the well shaft was 150 pounds per square inch at the surface, necessitating capping of the well, building of sump pools to prevent leakage into Salmon Creek, and cementing-in of the well casing to a point below the water stratum to cut off further flow. The salt water that was collected in the pools was later gradually released under direction of the Bureau at the period of high water run-off in the stream. The dilution by fresh water was sufficient to prevent any harm to salmon eggs or fry. In order to assure full protection to the salmon populations in the event that further similar deposits should be encountered, the drilling association voluntarily installed more than a mile of 6-inch pipe to carry any wastes from the well to a point on the Pacific side of the peninsula where they may be disposed of without danger to salmon runs.

## STREAM MARKING

New markers defining areas closed to commercial fishing were erected to replace those which had become illegible or damaged, and changes were made in the positions of others to conform with changes made in the regulations with respect to closed areas.

## STREAM GUARDS

The Bureau employed 134 men in 1938 as stream guards, weir operators, and special workmen in connection with law-enforcement duties. Of these, 57 were stationed in southeast Alaska, 45 in central, and 32 in western Alaska. Some of the workers were engaged for only a few days, but the average period of employment ranged from 2 to 5 months.

In southeast Alaska 21 stream watchmen furnished their own launches and were assigned to patrol larger bodies of water, or in the vicinity of several streams.

In central Alaska 10 guards were stationed in the Seward-Katalla district, 8 on Cook Inlet, 16 in the Kodiak-Afognak district, 3 at Chignik, and 8 in the Ikatan-Shumagin district. Eight of these guards, most of whom were in the Seward-Katalla district, furnished their own launches.

In western Alaska 29 were on Bristol Bay and 3 in the Yukon-Kuskokwim district.

There were also 11 special employees engaged in scientific work—3 on herring and 8 on salmon investigations. This work was carried on in southeast and central Alaska, as heretofore, and in addition an extensive study of the salmon was begun in the Bristol Bay region.

In addition, there were 12 statutory employees, 50 men on the Bureau's vessels, and 2 on the chartered boat.

The foregoing makes a grand total of 209 persons identified with fishery protective work in Alaska in 1938, as compared with 236 in 1937.

### VESSEL PATROL

Fourteen vessels of the Bureau were engaged in the patrol for the protection of the Alaska fisheries in 1938. Of these, the *Auklet*, *Kittiwake*, *Merganser*, *Murre*, and *Widgeon* were used in southeast Alaska; the *Eider* was in the Kodiak area, the *Ibis* at Chignik, the *Red Wing* in the Alaska Peninsula area, and the *Coot* on the Yukon River.

The *Blue Wing* was based in the Icy Strait district for a short time in June, then engaged in the patrol and stream survey work on Prince William Sound until August 28, when it was again assigned to southeast Alaska for a brief period before returning to Seattle. As in the previous year, the *Crane* carried part of the Bristol Bay crew and supplies north from Seattle in May and then patrolled the Alaska Peninsula area until the end of July, after which it returned the Bristol Bay crew to Seattle. The *Teal* operated on Cook Inlet from May to August, carried on stream survey work in the Prince William Sound area during most of the month of September, and was used in stream survey and general patrol of the Ketchikan district of southeast Alaska during the fall season until October 19.

The *Scoter* conducted the general patrol of the Bristol Bay area from May 22 to August 3 and then relieved the *Crane* in the Alaska Peninsula area until August 14, after which it returned to Seattle. In the spring, from March 17 to April 12, the *Scoter* assisted in the fur-seal patrol off Cape Flattery, Wash., during the northward migration of the fur-seal herd.

The *Brant* was used in general supervisory work, chiefly in southeast Alaska. In July it made a trip westward as far as Anchorage. On the return trip to southeast Alaska the *Brant* on the morning of July 15 ran aground on Williams Reef, about 8 miles east of Kodiak, causing considerable damage. The Navy vessel *Teal* rendered assistance, towing the *Brant* to Kodiak and later to Hoonah, in southeast Alaska. The *Brant* was towed by the Coast Guard patrol boat *Alert* from Hoonah to Ketchikan, and by the Bureau's patrol vessel *Crane* from Ketchikan to Seattle, where it was laid up for a number of months. In December, the *Brant* made a round trip between Seattle and southeast Alaska in connection with hearings on the Alaska fishery regulations at Ketchikan, Petersburg, and Wrangell.

A minor accident reported during the season was the striking of an uncharted rock in Moira Sound by the *Kittiwake* on July 30. The vessel was able to proceed under its own power to Ketchikan, where repairs were made. The work of the *Eider* in the Kodiak district was cut short on August 19 by a broken crankshaft in the main engine, and the vessel was out of commission for the rest of the season. It was towed by the Bureau's vessel *Teal* to Hoonah, and thence by other Bureau craft to Seattle.

Five speed boats were in operation: No. 1 on Bristol Bay, No. 4 in Prince William Sound, and Nos. 3, 5, and 6 in the Wrangell, Ketchikan, and Juneau districts, respectively. Speedboat No. 6, equipped with a 225-horsepower engine, was in operation this year for the first time. A new 150-horsepower engine, installed in August, greatly improved the service of speedboat No. 4, which had previously been equipped with the 80-horsepower engine salvaged from speedboat No. 2 at the time it was destroyed by an explosion in 1935. Fourteen other small power boats were in use also, of which 5 were on Bristol Bay, 1 at Chignik, 2 in the Kodiak area, 2 on Cook Inlet, 2 in the Seward-Katalla district, 1 at Yakutat, and 1 on the west coast of Prince of Wales Island.

In addition to the foregoing, the *Wingham* was again chartered for patrolling the Copper River flats and, at the close of activities there, for operation on Prince William Sound, and the chartered launch *Marie S* was used on the Kuskokwim River.

### AERIAL PATROL

Supplementing the regular operations by Bureau vessels and small boats, some use was made of aircraft in the general patrol of traps and fishing grounds. The latter is considered a very effective means of enforcing the fishery laws and regulations, particularly from the standpoint of deterring illegal fishing. Rough water may at times prevent the landing of a plane for making proper investigation when violations are noted, but the possibility of apprehension, when it is known that airplanes are being used for patrol purposes, makes the fishermen more careful to observe the regulations for the protection and conservation of the fisheries.

Chartered airplane service for the patrol of the fisheries in 1938 was furnished by six companies on 23 days. The total flying time was 56 hours, during which the planes traversed 6,246 miles. This patrol included three trips made from Anchorage, covering sections most extensively fished on the east and west coasts of the Cook Inlet area. Twelve and one-half hours flying time were used in the Copper River and Prince William Sound areas, and from 6 to 10 hours each in the Ketchikan, Juneau, Wrangell, and west coast of Prince of Wales Island districts of southeast Alaska.

In addition, chartered airplane service was used for survey and photographic work in connection with scientific investigations of the salmon which were conducted in the Bristol Bay region in western Alaska from July 23 to October 13, 1938. Transportation was furnished on approximately 25 days during this period, and the total flying time amounted to 102 hours, in which the distance covered was about 9,200 miles.

### COMPLAINTS AND PROSECUTIONS

In southeast Alaska a floating trap of Libby, McNeill & Libby near Pulizzi Island was found fishing on July 3 during a weekly closed period. The head watchman claimed he thought the day was Saturday, instead of Sunday. The company, through its attorney, pleaded guilty before the U. S. Commissioner at Juneau and was fined $600. The following week a floating trap of the Pacific American Fisheries, Inc., at Pt. Alava was found fishing on Sunday. Complaint against the company and the 2 watchmen, Jack Toner and Roger Davies, was filed before the Commissioner at Ketchikan, who fined the company $500 and sentenced each man to 3 months in jail.

Fourteen purse seine boats were apprehended for illegal fishing in southeast Alaska, and the operators were tried before local U. S. Commissioners, 2 cases being brought before the court at Hoonah, 7 at Ketchikan, and 5 at Craig. In the case against Reuben Eskeberg, operator of the *Cascade*, apprehended for fishing within 500 yards of the mouth of a salmon stream in Excursion Inlet, a fine of $60 was assessed; while in the case of the *Louise*, found fishing at the mouth of a salmon stream in Tenakee Inlet, the 5 operators, namely, John Kane, Captain; George Paul, William Thomas, Andrew Ibona, and Nicholas Johnson, were fined $25 each, and fish aboard the vessel were seized and sold for $23.08.

Of the defendants tried at Ketchikan, Alex Bryant, captain of the *Mary Lou*, was fined $100, and crew members James Scott, John Davis, Jr., William West, and Henry Littlefield were fined $50 each, for fishing in closed waters at the mouth of Smeaton Creek. Henry Benson, operator of the *Joycelyn*, was fined $25 for fishing within 500 yards of the mouth of a salmon stream in Harry Bay after the beginning of a seasonal closed period. A similar fine was imposed upon Ben Ridley, operator of the *Empress*, for like violations in the same locality, and the salmon aboard the vessel at the time of the apprehension were confiscated and sold for $94.14.

Fines of $25 each were assessed against Ronald Leask and M. M. Dunlap, operators of the *Sea Lad* and *Helen H*, respectively, for fishing within 500 yards of a salmon stream in Thorne Arm during a seasonal closed period, and salmon taken from them were sold for $26.76 and $79.95. Lars Larson, operator of the *Deloma*, was fined $25 for fishing during a closed period within 500 yards of the mouth of a salmon stream in George Inlet, and his illegal catch of salmon was surrendered and sold for $112.78 for the account of the Government. A fine of $25 was assessed against Everett Hudson, operator of the purse-seine boat *Mary Eleanor*, for fishing in closed waters at the mouth of a salmon stream in Weasel Cove, Boca de Quadra, during a seasonal closed period, and his forfeited catch was sold for $39.11.

Of the purse-seine fishermen arraigned before the Commissioner at Craig, fines of $25 each were assessed against Robert Crawford, captain, Lincoln Crawford, and George Mills, of the *Spray*, for fishing about one-half mile inside the markers at Shipley Bay, and against Alfred W. Willard, captain, Orvalle C. Jones, and Melvin M. Jole, of the *31A655*, apprehended at Shipley Bay for carrying shorter seines than the minimum length specified by the regulations. These short seines were ordered sewn together to make one legal seine, and after this was done the seine was inspected by the Bureau's warden.

Three operators of the *Lois W*—Harry Whitten, captain, Clarence Keily, and Eddie Kahaipo—were fined $50 each for fishing within 500 yards of the mouth of the Essowah Lake outlet, a red salmon stream on the west coast of Dall Island, and five operators of the *Silver Wave*, namely, Sid Carle, captain, William Carle, Hugh Baden, Dewey Dudley, and Paul Ozawa, were fined $75 each for fishing on Sunday at the mouth of a salmon stream in Klakas Inlet. The confiscated fish from these two boats were sold for $13.30 and $165.95, respectively. The seine boat *31A985* with a crew of three men—Hermi Valdez, captain, Roy Dado, and Marciana Canote—was found fishing after the beginning of a seasonal closed period in a restricted area in Klawak Harbor, although no fish had been caught. The fine in this case was $20 each, or a total of $60, which was paid by the Ocean Packing Co.

Lewis Duval, of Petersburg, was apprehended for fishing in closed waters in Kah Sheets Bay and during a closed period with a beach seine 30 fathoms long, an illegal type of fishing apparatus in this locality. The above case was dismissed after the defendant was found guilty on another charge and sentenced to 6 months in jail. Another fisherman, Ed Haynes, illegally using a 45-fathom beach seine in closed waters of Lake Bay, was sentenced by the Commissioner at Wrangell to 60 days in jail and fined $50. At the same time an additional sentence of 30 days in jail, together with a fine of $50, was imposed against this defendant for fishing without a license, in violation of the Territorial law.

Norman Tate and Hugh Harris, operators of the boat *Ann*, were apprehended for fishing at the head of Shipley Bay with small-mesh net, which they claimed was a gill net, although it was really a beach seine, not permissible in this locality. In Commissioner's court at Craig the men pleaded not guilty and subsequently, upon recommendation of the Assistant District Attorney, the case was dismissed in view of the fact that the regulations did not specify the size of mesh to be used in gill nets. The operators were warned against further use of illegal apparatus.

O. R. Batterson, operator of the trolling boat *Arline B*, apprehended for fishing during a weekly closed period near Cape Chacon, pleaded guilty in Commissioner's court at Ketchikan and was fined $50, which fine was suspended. Pascual Roma Niere, who engaged in trolling for salmon commercially during a weekly closed period, pleaded guilty before the Commissioner at Wrangell and was fined $50 and sentenced to 30 days in jail. Four king salmon taken by him were seized and sold for $3.63. This defendant also was found guilty of violation of the Territorial law on two counts, namely, being an alien and fishing without a license, for which he was fined $50 and sentenced to 30 days on each count, the jail sentences to run concurrently with that imposed for violation of the Federal law.

Two cases were brought before the local Commissioner against residents of Yakutat for fishing with set gill nets less than 100 yards apart. One of these violations involved nine persons, as follows: Henry Shodda, Moses Milton, Ned Williams, David Henry, Paul Henry, Jack Reed, Eugene George, Richard Reese, and Tom John In the other, the following four persons were concerned: David Abraham, Mary Henninger, Sam Bagge, and George Valle. All were found guilty, and fines of $30 each, with costs, were assessed. In the case of Henry Shodda, however, the fine and costs were suspended pending good behavior, as he was new in the area.

George Anderson and Oscar Peterson were apprehended in the vicinity of Monte Carlo Island, Keku Strait, for possessing illegal fishing gear consisting of a 25-fathom beach seine. Each was given a 90-day suspended sentence, and the seine was destroyed.

Several pieces of fishing apparatus were found that were evidently being used in violation of the fishery laws and regulations, but the owners were not apprehended. This apparatus included a 20-fathom seine found cached on the bank of a stream tributary to Calder Bay; a trap constructed across the Essowah Lake stream and a 25-fathom seine nearby; a piece of old gear stretched across Andrews Creek near Wrangell; a small gill net, a 10-fathom line, and about 10 fathoms of chicken wire in Klakas Lake stream; and a 75-fathom gill net in Sumner Strait. Except for the last-mentioned gill net, which was turned over to the marshal, this apparatus was destroyed.

The case against the Lindenberger Packing Co., of Craig, for canning fish more than 48 hours after their capture in the 1937 season, which was continued until the spring term of court in 1938, was dismissed. In the case pending at the close of 1937 against Frank Richardson, charged with fishing with a small seine at the mouth of Blind River, Wrangell Narrows, a trial by jury, at the defendant's request, was held on August 8, 1938. The defendant was acquitted on the plea that the markers were not at the mouth of the stream but that the tide backs up 1½ miles above them.

In the Seward-Katalla district, 11 cases of illegal fishing, involving 14 persons, were brought before Commissioner's court, and convictions were obtained and fines imposed in all instances except one. Of these cases, one involved the taking of undersized clams for commercial purposes by A. W. Marcus, who was fined $25. His forfeited catch, amounting to 452 pounds, was sold for $24.86. There were four cases of illegal seine fishing for salmon, as follows: Jack Brady, fishing with a skiff and seine during a weekly closed period, fined $100; Oscar Donaldson, fishing aboard the *Katherine L* during a weekly closed period in a restricted area at the head of Eaglek Bay, fined $75; Arthur G. Clark and William Imlach, fishing with seine boat *31B839* in the mouth of a salmon stream in Hawkins Cutoff, fined $50; and William Stears and Clarence Betchel, fishing with the *Cambria* inside markers at the mouth of lagoon in Eaglek Bay, fined $50.

Six violations in the Seward-Katalla district involved the illegal use of stake or set gill nets in sloughs of the Copper River area which were closed to commercial fishing. In one case, that against William P. Smith, operator of the boat *31D463*, observed in Pete Dahl Slough by the Bureau's warden while on airplane patrol on June 11, the defendant denied any knowledge of the set net, and the case was dismissed for lack of sufficient evidence. In the other cases pleas of guilty were entered in Commissioner's court and a fine of $75 was assessed against each defendant, as follows: Harold Couzins, operating stake net in Walholla Slough on May 24; Charles Christensen, set netting in Pete Dahl Slough with the boat *31B540* on June 11; Otto Tiedeman and Emil Freeman, using set nets in Pete Dahl Slough on June 11; and Wilbur Platt, with the boat *31A956*, and Gilbert Young, with the boat *31B353*, using set nets inside Mountain Slough on July 8. One hundred and twenty-one red salmon in the possession of Harold Couzins at the time of his apprehension were sold for $33.28. A catch of 451 red salmon was surrendered also by Messrs. Tiedeman and Freeman and sold for the account of the Government for $124.03.

In the Cook Inlet area six cases of violations of the regulations were reported, most of which were observed by means of airplane patrol. A trap owned by the Cook Inlet Packing Co. and located about 15 miles north of Ninilchik Village was found with the tunnel not closed and the heart walls not lifted or lowered during a weekly closed period in accordance with the method prescribed by section 5 of the Act of June 6, 1924. Complaint was filed before the Commissioner at Seldovia against both the company and the trap watchman, Simeon Oskolkoff. The latter admitted the charge but claimed his timepiece was wrong. He was fined $100. The company, through its managing owner, pleaded guilty and was fined $200.

Otto Rensing, operator of power boat *31C40*, found fishing with a beach seine inside markers at the mouth of Chinik Creek on July 13, was taken before the Commissioner's court at Seldovia, where he pleaded not guilty. As he had been apprehended with others earlier in the season fishing in McNeil Creek and had been dismissed with a warning, he was bound over to the District Court under $500 bond. When the case came before the Grand Jury in November, it returned a nontrue bill.

Fines of $50 each were assessed by the Commissioner at Anchorage against Buster Ephin and George Johnson, apprehended for operating set gill nets during a weekly closed period in Cook Inlet, the former having three set nets about 5 miles southwest of Point Possession on June 13, and the latter using a set gill net on June 6 and two of such nets on June 13 in Lewis River Slough.

Prosecutions were brought before the Commissioner at Seldovia against Michel McDonough and Frank Manton for operating three set gill nets about three-fourths mile south of Cape Kasilof during a weekly closed period. The latter claimed sole responsibility for the violation and pleaded guilty as charged. The court assessed a penalty of 30 days in jail and suspended the sentence. An anchored gill net, found fishing between Beluga River and Three Mile Creek during a weekly closed period, was seized and 10 king salmon therein were sold for the account of the Government. Later it was learned that the net belonged to Mrs. T. B. Ryan and that she was fishing for her dogs. After due investigation and conference with the United States Attorney, the net and the money received from the sale of the salmon were returned to the owner.

In the Kodiak area, two gill-net fishermen, Frank Marshall and Mike Naumoff, were arraigned before the Commissioner at Kodiak for fishing in Olga Bay during a weekly closed period. They pleaded guilty and were fined $25 each. Operators of three purse seine boats in this area also were brought before the Commissioner's court at Kodiak, where they pleaded guilty and were fined, as follows: Pat Gowan and L. Rachford, fined $25 each for setting seine from the *Jaquelin* alongside another purse seine in the Karluk district, after having been warned to observe the 100-yard distance interval; and Edwin Liljegren, operator of the *L & W*, and Ben Durkee, operator of the *Triton*, fined $75 and $100, respectively, for fishing along Seven Mile Beach during a seasonal closed period. Seized fish, consisting of 2,411 pinks and 160 chums, from the *L & W* were sold for $123.70, and 3,439 pinks and 803 chums from the *Triton* were sold for $195.03.

In the Alaska Peninsula area, the purse seine boat *Blanche*, commanded by John Bacoka, was apprehended on June 17 for fishing about one-quarter mile from a salmon trap in East Anchor Cove. Upon trial before the Commissioner at Squaw Harbor, the defendant pleaded guilty and was fined $75, with a warning also that any future violations by operators in the district would receive sterner action. Fish aboard the vessel at the time of the seizure were valued at less than $3 and were not confiscated. Andrew Hotovitsky, beach seiner commanding the gas boat *Swinomish*, was apprehended on July 22 for fishing in closed waters at the mouth of a salmon stream in Little Canoe Bay. He pleaded guilty in the Commissioner's court and was fined $200. His forfeited fish, consisting of 1,238 chums and 294 pinks, were sold for $82.37.

Evidence of illegal fishing in Thin Point Lagoon resulted in investigation of Andrew Hotovitsky and Alex Bendixsen. Circumstances surrounding the cases prevented any conviction. Mr. Bendixsen was released with a warning, and Mr. Hotovitsky was ordered to appear some time later in Commissioner's court at Squaw Harbor, although his fishing gear was not seized and he was allowed to continue fishing. Meantime the case was reviewed by the Commissioner and, owing to insufficient evidence, it was dismissed without a hearing.

No violations of the Federal fishery laws and regulations were reported for Bristol Bay. In this area, however, 115 complaints were filed against alien fishermen under the Territorial law (Chapter 30, Session Laws of Alaska, 1933), on which there were 62 convictions. Fines totaling $10,600 were collected, and suspended fines amounted to $350. Jail sentences were enforced in 58 cases and suspended in 4 cases.

## TERRITORIAL LICENSE TAX

Fisheries license taxes were collected by the Territory under the general revenue law of 1921, as amended in subsequent sessions of the Territorial Legislature. A statement from Oscar G. Olson, Territorial Treasurer, under date of June 6, 1939, gives the collections made to that date for the year 1938, representing the taxes on operations of the previous year. It was stated that collections under the several schedules were fairly complete, although a few of the fisheries companies had not yet made full settlement.

It will be noted that the following schedule includes the amounts collected for clam diggers' and fishermen's licenses, which have previously been omitted from the report.

*Fishery license taxes collected by Territory for fiscal year ended Dec. 31, 1938*

| Schedule | Division No. 1 | Division No. 2 | Division No. 3 | Total |
|---|---|---|---|---|
| Salmon canneries (pack) | $150, 765. 01 | $22. 00 | $512, 426. 21 | $663, 213. 22 |
| Clam canneries |  |  | 355. 83 | 355. 83 |
| Salteries | 2, 483. 42 | 82. 28 | 1, 140. 64 | 3, 706. 34 |
| Cold-storage plants | 1, 175. 00 | 10. 00 | 50. 00 | 1, 235. 00 |
| Fish-oil works and fertilizer and fish-meal plants | 10, 729. 40 |  | 22, 383. 73 | 33, 113. 13 |
| Fish traps | 53, 100. 00 |  | 32, 150. 00 | 85, 250. 00 |
| Trap catches in excess of 100,000 fish | 7, 499. 91 |  | 16, 182. 44 | 23, 682. 35 |
| Gill nets | 675. 00 | 30. 00 | 3, 646. 40 | 4, 351. 40 |
| Seines | 3, 885. 00 |  | 2, 260. 00 | 6, 145. 00 |
| Clam diggers: |  |  |  |  |
| Resident | 5. 00 |  | 265. 00 | 270. 00 |
| Nonresident |  |  | 75. 00 | 75. 00 |
| Fishermen: |  |  |  |  |
| Resident | 2, 812. 00 |  | 2, 485. 00 | 5, 297. 00 |
| Nonresident | 24, 575. 00 |  | 49, 625. 00 | 74, 200. 00 |
| Total | 257, 704. 74 | 144. 28 | 643, 045. 25 | 900, 894. 27 |
| Salmon canneries (net income), not possible of segregation as to judicial division |  |  |  | 7, 053. 02 |
| Total collections |  |  |  | 907, 947. 29 |

## KUSKOKWIM RIVER

A patrol of the Kuskokwim River was maintained by Theodore R. Lambert, with the chartered launch *Marie S*, from the first of June until the end of August.

King salmon appeared at the mouth of the river on May 20, or somewhat earlier than usual, and the run continued steady through June, after which a few late stragglers were taken until the end of July. Most of the kings taken by natives, particularly near the mouth of the river, are for daily use, as they require more time and attention for drying than do other species.

Both chum salmon and reds were unusually abundant this year. A heavy run of chums started on June 19 at the mouth of the river and continued strong until the middle of July, when it dropped off sharply. The bulk of the red-salmon run entered the river between July 1 and July 15. Toward the end of July a few cohos were taken in the vicinity of Bethel, and a good run began on August 1, which continued heavy for only a few days while a southwest wind prevailed. Stormy weather throughout August made it impossible to dry cohos except under cover in the smokehouses. All natives who fished with any regularity had previously caught and cured sufficient fish for their winter use, and many disposed of a surplus to traders. The latter by the end of July had obtained all they could handle during the winter.

Fishing apparatus used by the natives between the mouth of the river and the Narrows consists mainly of set nets, from 9 to 30 fathoms in length. Drift nets are not considered practical for general use in this locality because of the extreme width of the river and the many bars and channels. Much of the time it is too rough offshore for the use of small boats. Between the Narrows and Tuluksak the bulk of the catch is taken by drift nets, from 25 to 50 fathoms in length, although set nets are used to some extent. Upstream above Akiak the current is stronger and the fish wheel is the main gear, with comparatively few drift and set nets in use.

The only commercial fishing operation in the district for the outside market was that of Robert Gierke, who reported an output of 6 tierces of pickled cohos and 12 tierces of pickled kings. Three hundred and eighty natives fished in the river for local food requirements, using 520 gill nets of 13,499 fathoms, 47 wheels, and a number of small boats. They prepared 243 tons of dried chums, 22 tons of dried kings, and 21 tons of dried reds.

## YUKON RIVER

Three outfits prepared mild-cured salmon on the Yukon River for the outside market, as follows: Northern Commercial Co., which operated on a barge in Acheron Channel; St. Mary's Mission, at the head of Sunshine Bay in Acropok Slough; and Chris Lauridsen, at Kwiguk Slough. Their total output of mild-cured salmon was 198 tierces of kings. The fish used by the Northern Commercial Co. were taken in gill nets outside the mouth of the Yukon River by native fishermen; while those handled by the other two operators were taken in the river by wheels and gill nets, respectively.

Inspector Calvin F. Townsend and a stream guard patrolled the district aboard the *Coot*, leaving Nenana on May 26 for the mouth of the Yukon and returning to Nenana on September 18. During the trip downstream the water was at low stage, with very little driftwood. At that time there was little activity at the camps, as the inhabitants were out hunting beaver and muskrats. In general, the supply of dried fish from the previous season had not lasted through the winter, but plenty of whitefish had been caught by means of traps through the ice.

The first king salmon were caught at the mouth of the Yukon on June 1, but the main run began on June 5 and continued good until

July 15. Chum salmon came into the river at the same time, and the runs of both species were unusually heavy. Beluga whales were more numerous than for many years and did considerable damage to salmon nets. Several of these whales were taken by the natives to supplement their regular supply of food.

As a result of the excellent runs of king and chum salmon and the good weather for drying fish, natives on the lower river had all the fish they needed for winter. The catches at camps in the upper reaches, however, were not uniformly good. In some places the catches were above average and in others very poor. An explanation for the light catches of kings at certain points was that the fish seemed to follow the main channel up the river and did not strike in close to shore, so they were not taken in the wheels and nets.

There was a marked shortage of salmon on the Tanana River, and the only camp which had any success in fishing was one about 8 miles from Tanana, where fair catches of cohos were obtained from the last week of August until the middle of September. Very few of this species were taken along the Yukon because of high water and heavy driftwood. As a result of storms in August the Tanana River was at flood stage from about the 10th to the end of the month.

Products of the Yukon and Tanana fisheries, including those shipped to the outside market, were as follows: 280 cases of king salmon canned; 198 tierces of mild-cured kings; 17,300 pounds of dry-salted kings; and 213 tons of dried chums. Apparatus consisted of 194 wheels, 88 gill nets of 2,100 fathoms, 3 motor vessels of 43 tons, 1 launch, 9 gill-net boats, 1 scow, and miscellaneous small boats. There were 11 whites and 382 natives engaged in the fishery.

## WEIRS FOR COUNTING SALMON ESCAPEMENT

The maintenance of weirs through which the escapement of brood fish may be counted provides information of value in the study of the life history of the salmon and in the regulation of commercial operations to prevent any impairment of the runs through inadequate seeding of the spawning beds.

Eleven weirs were operated in representative streams of Alaska in 1938, and a count of salmon was again made at the Kalgin Island stream without the use of a rack. It was the purpose, also, to reestablish the weir in Chignik River, which had been operated each season since it was first placed there in 1922, but unusually high water for a prolonged period made all attempts to construct it unsuccessful.

Reports of the weir operations and the counts of salmon in 1938 were as follows:

### ALITAK BAY

Two weirs were again established on Olga Bay, tributary to Alitak Bay, construction of the cannery station weir being completed on May 26 and the upper station weir on May 29. At each place the counting of red salmon began on the day the weir was ready and was continued until the structure was removed on August 29. The total count for the season at the upper station weir consisted of 616,064 red salmon, 3,371 pinks, and 9,085 cohos. Corresponding figures for the cannery station weir were 97,455 red salmon, 23,701 pinks, and 371 cohos.

In the latter part of July the catch of red salmon in the Alitak Bay district was substantially larger than the escapement. Olga and Moser Bays, therefore, were closed to commercial fishing at 6 p. m. on July 30 and reopened at 6 a. m. on August 13. During that interval approximately 319,000 red salmon were counted through the weirs, the bulk of the escapement being during the second week and reaching its peak on August 13, when 61,541 fish of this species were tallied.

A trout trap operated at the upper station weir took 10,047 Dolly Varden trout during the season, and one at the cannery station took 6,953 of these predatory fish.

Work at the cannery station weir was carried on by Morris Rafn, and at the upper station weir by Lloyd Burns, under the direction of Warden J. Steele Culbertson.

### Chignik River

No weir was maintained in the Chignik River in 1938, as it was impossible to establish the structure because of high water. After repeated attempts to construct it were unsuccessful, the work was finally abandoned toward the end of June.

In general, there was a rather light run at Chignik during the season. The commercial catch was 407,605 red salmon, and it was estimated that 550,000 of that species escaped to the spawning grounds. The early escapement was good, owing to the fact that salmon traps were not installed until the latter part of June. Chignik Lagoon and part of Chignik Bay were closed to commercial fishing from 6 a. m. August 15 to 6 a. m. August 19, in addition to the closed periods specified by the regulations.

### Chinik Creek

From July 6 to July 29, inclusive, 3,804 red salmon were counted through the weir at Chinik Creek, and it was estimated that 200 reds were in the stream below the weir at the time the structure was removed. The peak of the run was on July 25, when 1,008 salmon were tallied. Irwin Metcalf was in charge of operations, under the direction of Capt. R. L. Cole.

### English Bay

The count of salmon in the stream at the head of English Bay began on June 8 and continued through August 13, during which time the total escapement numbered 16,779 red salmon. The largest count for any one day was 806 on July 26. Weir operations were carried on by Percy G. Maltbie until August 6, and then by Irwin L. Metcalf, under the supervision of Capt. R. L. Cole.

### Fish Creek

Counting operations at the weir in Fish Creek were carried on from July 10 to August 8, inclusive, the total number tallied consisting of 182,463 red salmon and 19,417 cohos. The latter species began to ascend on July 24 and were estimated to be 10 percent of the total count for the first week and 20 percent thereafter, as it was impossible for the operator to make an exact count of each species. The bulk of the red salmon escapement passed upstream in the period from July 22 to August 1, reaching a peak on July 23, when 23,540 fish were counted. Jack Tansy was assigned by Capt. R. L. Cole to perform the work at this weir.

### KALGIN ISLAND CREEK

As in previous years, the stream guard stationed near the salmon stream on the east side of Kalgin Island made a count of the red salmon escapement, although no weir was established in that stream. From June 15 to August 3, inclusive, there were tallied 5,046 red salmon, about one-third of which passed upstream during the last week in July.

### KARLUK RIVER

Construction of the weir in Karluk River was begun on April 9 and completed on April 13. Although virtually all ice had gone out of the river, high water made the weir construction rather difficult. Both red and king salmon began to pass upstream on May 19, but the numbers were small until June 8, when a very good run set in. Within the next 3 weeks more than 700,000 red salmon were counted through the weir, the run reaching its peak on June 18, when 83,102 salmon were counted. The large escapement during this period was owing partly to the fact that very little fishing was being carried on, as operations in the district had been delayed on account of the strike of cannery workers.

Pink salmon appeared off the mouth of the river on July 17 and began to pass through the weir two weeks later. A very heavy run of pinks entered the river during August. Owing to the large number of spent fish coming downstream, it was impossible to keep the weir closed after September 3, and the structure was finally removed on September 26.

The total escapement for the season consisted of 1,075,678 red salmon, 1,714,589 pinks, 40,000 cohos, and 5,606 kings. These figures include an estimated escapement of 200,000 reds, 75,000 pinks, and 40,000 cohos during the period from September 4 to September 26, when the weir was left open. Commercial fishing in the Karluk district was closed on September 3 for the remainder of the season, in order to assure a 50-percent escapement. The total commercial catch of red salmon from the Karluk run was 976,904.

In connection with the operation of the Karluk weir, traps were installed for the capture of Dolly Varden trout, and 51,385 of these predatory fish were taken during the season.

Weir operations were in charge of James O'Brien, under the direction of Warden J. Steele Culbertson.

### KLAWAK CREEK

Construction of the weir in Klawak Creek was completed on May 24 and counting operations began on the following day, when a few red salmon passed upstream. This run was light but fairly steady throughout the season. On August 10 the first pinks and cohos were tallied. The run of pink salmon reached its peak on September 16, when 64,119 fish of this species were tallied through the weir. The total escapement numbered 357,751 pinks, 22,209 chums, 15,368 reds, and 4,398 cohos, including an estimate of 15,000 pinks, 4,000 chums, and 1,000 cohos on September 26. Heavy rains the night of September 25 caused the creek to rise about 4 feet, as a result of which the weir was damaged beyond repair for the season. Lloyd M. Johnson was weir foreman, under the direction of Warden Donald S. Haley.

### Little Port Walter

At the Little Port Walter weir, operated in connection with the biological study of pink salmon in southeast Alaska, there were counted 6,467 pink salmon, 5 chums, and 1 coho in the period from August 29 to September 22, inclusive. It was estimated that 200 salmon were in the bay when the weir was removed.

### Orzenoi River

From June 14 to Aug. 7, inclusive, there were counted at the weir in Orzenoi River 8,675 red salmon, 1,764 pinks, 510 chums, and 40 kings. The peak of the run was on July 17, when 1,427 red salmon passed through the weir. During most of July the stream was low, as there was little rainfall. Gordon Ashton carried on the weir work at this place, under the direction of Acting Warden Mark Logan.

### Red River

King salmon began to pass upstream through the Red River weir on May 21, and reds on May 25. The run of red salmon was somewhat smaller than in other recent years, the total count for the season numbering 185,851. Other species tallied were pinks, 406,725; kings, 4,465; and cohos, 2,169.

Counting operations were continued until heavy rains caused the river to rise over the top of the weir on August 25. As the structure was badly damaged, its removal was begun on the following day when the high water subsided. There was a fair showing of salmon in the lagoon and some outside the river in the strait at that time. It was estimated, therefore, that the total escapement of reds would be more than 200,000. The Red River district was closed to commercial fishing for salmon after August 13, as the catch was then considerably in excess of the escapement.

Two trout traps operated in connection with the weir caught 54,317 Dolly Varden trout during the season.

The work at this place was in charge of Woodrow Buckley, under the supervision of Warden J. Steele Culbertson.

### Situk River

Construction of the weir in Situk River was completed on June 7, and the first red salmon were counted on June 12. No count was made from June 18 to June 25, inclusive, as the weir was out of commission during a period of high water. As soon as the river fell sufficiently, the weir was dismantled and reestablished about 30 feet above the former site. Counting was resumed at noon on June 26 and continued through August 2, when the weir was removed because of high water and anticipated floods which threatened a loss of materials. The total count numbered 169,333 red salmon, 28,319 pinks, and 2,668 kings. A. W. Tveter carried on the weir operations under the direction of Warden William B. Berry.

## SALMON TAGGING

A salmon-tagging experiment was conducted in southeast Alaska in 1938 to develop further information concerning the migration routes of pink salmon through lower Chatham Strait. Approximately 2,100 mature pink salmon were tagged from July 7 to Aug. 12, inclusive, the work being done at traps in Tebenkof Bay by employees of the Division of Scientific Inquiry. Of the total number tagged, 637 salmon, or slightly more than 30 percent, were recaptured by the commercial fishery. It is planned to conduct a similar experiment in 1939 to determine any differences in the migration routes of the pink-salmon runs in even- and odd-numbered years.

In the 1938 season, also, a tagging experiment was carried on in the Kodiak area to determine the length of time the fish take to travel from Alitak Bay to weirs in Olga Bay. As commercial fishing is controlled by the weir count, it seemed advisable to determine the lag between catch and counted escapement. Seven hundred red salmon were tagged at the Bun Point trap of Pacific American Fisheries on June 28, and 458 were tagged on July 29 at the Miller Island trap. The work was done by Associate Aquatic Biologist Joseph T. Barnaby and Junior Aquatic Biologist Allan C. DeLacy, assisted by the crew of the *Eider* and Stream Watchman Morris Rafn. A red streamer-type tag, designed by Messrs. Barnaby and DeLacy, was used for the first time in this experiment. The tags were attached to the dorsal part of the body just posterior to the dorsal fin and were readily observed as the fish passed through the weir.

Of the fish tagged in the Kodiak area in June, less than 5 percent were observed subsequently at the weirs, while nearly 50 percent of those tagged in July were counted. A closed period from Aug. 1 to 12 in the commercial fishing season aided in obtaining a larger escapement from the latter tagging.

The fish tagged in June took an average of 7 days to go to the cannery station, and 9 days to the upper station. In the second experiment, however, the fish took an average of 17 days to go to the cannery station, and 11 days to the upper station. No explanation can be given as to the relatively short period taken to reach the upper station, compared with that taken to reach the cannery station. This investigation indicates that the fish arrive at the weirs from 1 to 2 weeks after they pass the fishing gear in Olga Bay.

## SALMON LIFE-HISTORY STUDIES

Studies of the life histories and fluctuations in abundance of the Pacific salmon in Alaska were continued in 1938 by the staff of the Fisheries Biological Station at Seattle, Wash. The major investigations of the red salmon at Karluk and the pink salmon at Little Port Walter were carried on as formerly. In July 1938 an appropriation was made available for a comprehensive and extended investigation of the red-salmon fisheries of Bristol Bay. This investigation consisted of two distinct parts, one dealing with the marine factors influencing the migration of the salmon and their availability to the commercial fishery, and the other dealing with the fresh-water life history and survival of the young in the lakes and streams.

Biological data concerning the red salmon were collected at Chignik and Copper River stations, as in past years. Studies carried on at Karluk River and Little Port Walter gave further insight into the natural factors that influence the abundance and survival of the salmon.

The studies concerning the influence of predatory trout at Karluk River and neighboring streams on Kodiak Island were continued. The tagging of these trout shows that they do not have the high degree of homing characteristics of salmon, but they wander back and forth between the streams on Kodiak Island.

Through the efforts of the C. C. C. workers, as directed by the Forest Service, the station at Little Port Walter was greatly improved by the construction of trails to the headwaters of the stream and of a dock with floating mooring for the accommodation of large boats that visit the field station. The Forest Service also used the stock of acclimated rainbow trout in Sashin Lake, one of the lakes at the head of the stream, for transplantation in many lakes on Baranof Island, and also for a stock sent to Fairbanks.

The collection, compilation, and analysis of the records of daily catches of salmon throughout Alaska by the principal types of fishing apparatus were continued in 1938 and, as in previous years, provided information as to the fluctuations in abundance and time of appearance of the runs in various districts. Considerable effort was made also in securing additional historic material and records on the fisheries of Bristol Bay in connection with the newly developed investigation of the red salmon in this area. The information secured from this work, as in previous years, was used in recommendations for changes in the fishery regulations throughout the Territory for properly conserving salmon populations.

## OBSERVATIONS ON THE ESCAPEMENT OF SALMON

The so-called "White Act" of June 6, 1924, established the intention and policy of Congress that not less than 50 percent of the salmon runs in Alaskan waters should be permitted to escape. In certain representative streams counting weirs are operated to accurately fulfill this requirement. Where the operation of weirs is not feasible the development of runs is closely observed so that regulations may be modified during the season if necessary, to secure the most desirable spawning escapement. There follows a general summary of salmon runs and escapement in each of the fishing areas of Alaska.

*Southeastern Alaska.*—The late appearance of pink salmon runs in southeastern Alaska was characteristic of the even-year cycle of this species in recent years. A prolonged dry season in August, and the consequent low level of streams, retarded the ascent of salmon to spawning areas, but heavy rains after the first of September relieved this condition in all districts. The fall survey of spawning grounds was hampered in many cases by the swollen condition of streams.

In the Ketchikan region, embracing the southern district and that part of the Clarence Strait district south of Ernest Point, the run was of average proportions and considerably better than in 1937. As in past years, the run appeared several days earlier in the southern district than in Clarence Strait, and in both sections it was at its peak as the fishing season closed. Stream inspections indicated a rather spotted seeding, but these districts generally appeared to have obtained adequate escapements. In the southern district the better spawning areas were well seeded, particularly streams in Very Inlet, Boca de Quadra, Smeaton Bay, and Rudyerd Bay. In the western portion of Behm Canal a good escapement of reds and a fair seeding of pinks were observed on the spawning grounds at Loring and Yes Bay. In the Clarence Strait section fair escapements were noted in Tolstoi Bay and Thorn Bay, while streams in Kasaan Bay, Cholmondeley Bay, and Moira Sound were well seeded.

In the Wrangell district, including the waters of Sumner Strait and Clarence Strait, north of Ernest Point, the run fell considerably short of last season and was the smallest that this district has seen in recent years. Indications are that additional protective measures are necessary to restore this run to its former abundance. A survey of streams in this area revealed a rather light escapement, but there appeared to be a fair seeding of the better spawning areas. particularly in Anan Creek, Salmon Bay, Bradfield Canal, and Totem Bay. A good run of reds and cohos occurred in the Stikine River area and the escapement there was believed to be ample for seeding purposes.

There was no heavy sustained run at any time during the season in the South Prince of Wales Island district. Pinks appeared in small numbers about August 13, and after August 27 there was a fair showing of this species off Dall Island, Cordova Bay, and Trocadero Bay. The run of sockeyes, while considerably better than in 1937, was below normal, and chum and coho runs also were disappointing. The total count of each species through the Bureau's weir in Klawak Creek was substantially below the average escapement in recent years. Spawning areas in Tuxekan Passage were well seeded, however, compared with the 1937 season, and Sarkar Lakes, Deweyville, El Capitan Passage, Calder Bay, Sea Otter Sound, and Davidson Inlet all had fair escapements.

On August 1 and 2 a good showing of pinks in Cross Sound proved to be only a spurt which tapered off as the run reached the inner section of Icy Strait and spent itself. The main body of pink salmon entered Icy Strait after fishing operations had been terminated in that district, and moved into the inner waters of Chatham Strait and Frederick Sound about the middle of August. The sun was heavy but of short duration and the escapement in the streams of Icy Strait was below normal. In the Western district, streams tributary to Chatham Strait were found to be well seeded with pinks, except in the Hawk Inlet area, where the escapement was poor. The streams inspected in the Eastern district indicated a good escapement for that section also, although the survey there was hampered by heavy rains and high streams. All three sections of the Juneau district experienced average runs of reds and cohos, and the escapement of these species was generally satisfactory. Chums were less abundant than in other years, however, and the seeding of this species was below normal.

The Yakutat area had a better than average run of reds and kings this season, especially in Dry Bay and Situk and Ahrnklin Rivers. Good escapements were reported for all important species in this area.

*Prince William Sound and Copper River region.*—The run of pinks was unusually late in Prince William Sound but developed rapidly after July 24, reaching large proportions in all sections during the last few days of the season. Pinks were so abundant throughout the area as the close of the commercial fishing season approached, that the Secretary of Commerce approved a supplementary regulation extending the season 2 additional fishing days. A survey of representative salmon streams indicated an excellent seeding of pinks in most spawning areas. Unusually heavy escapements were observed in the northern and eastern sections of the Sound.

A good run of red salmon occurred in the Copper River area, reaching its peak shortly after the first of June. The escapement to the upper river was very satisfactory, owing partly to the stormy weather that hampered fishing operations and reduced the commercial take.

*Cook Inlet.*—Although the early run of reds in Cook Inlet was light, the main run appeared in good volume after July 19 and continued strong until August 8. This run was good throughout the Inlet, and was especially heavy between the Kenai and Kasilof Rivers, and in the vicinity of Salamato Beach, between East Foreland and Kenai River. The run of kings was lighter than usual, amounting to only about two-thirds of its normal size. A good escapement of reds was observed on the major spawning grounds, especially in Kasilof and Kenai Rivers, but in Chinik Creek, Cottonwood Creek, and the Kalgin Island stream the escapement was almost a failure. The pink-salmon run was considered fair in most sections, and the seeding of this species as a whole was good, especially in streams south of Anchor Point.

*Kodiak area.*—The run of reds in the Kodiak area varied considerably in the important red producing sections. The Alitak Bay region had an unusually large run and escapement; in Red River the showing of reds was very poor; and in the Karluk region a normal run occurred and the escapement was good. Kodiak Island as a whole had a light run of pinks, as is generally the case in the even years, although the pink run at Karluk was the largest in many years, and Red River, Alitak Bay, and Uganik Bay had good runs of this species. It is believed that the escapement of pinks was adequate for seeding purposes. The run and escapement of chums was very good generally, but the showing of kings and cohos was only fair.

*Chignik.*—The runs of all species in the Chignik area were very light this season, but the fact that commercial operators were late in installing traps contributed to the escapement of early runs. Only one trap was operated during the month of June and the red run reached its peak during the last week of that month. The run of pinks was the weakest since 1931, and the showing of cohos and chums was also poor. Unusually high water in the Chignik River prevented the installation of the weir this season. Stream observations, however, indicated a good escapement of red salmon, although the seeding of other species was poor.

*Alaska Peninsula.*—The red run in Peninsula waters this season was unusually heavy, although, for unknown reasons, fishing gear on the south side of the Peninsula intercepted a smaller portion of the run than in past years. Pinks and chums were late in arriving but were abundant after July 22, with the exception of a slack period from August 7–10. The run was characterized by the unusually small size of pinks, which in some instances were packed 40 or 50 to a standard case of 48 1 pound-cans. Although not as comprehensive as desired, the survey of spawning areas indicated a rather spotted escapement. It is believed that the Peninsula streams generally were not as well seeded as in other recent years.

*Bristol Bay.*—The best red-salmon run in the history of the area occurred in Bristol Bay this season, reaching its heaviest volume in the Kvichak-Naknek district and in the Nushagak district. In most sections the run started on July 5, and held up well until the 23d, reaching its peak about the middle of the month. Reds appeared in the Ugashik district at least a week later than in other sections, but the run in this section, as well as in the Egegik district, was weak.

Extensive observations were made, by airplane and boat, of the spawning areas accessible to Bristol Bay red salmon. Of the four important watersheds, the Kvichak-Naknek and Nushagak systems received excellent escapements, the Egegik region was rather poorly seeded, and the Ugashik streams were only thinly populated as usual. Taken as a whole, however, the spawning beds of the Bristol Bay area were well seeded.

## GENERAL STATISTICS OF THE FISHERIES

The total number of persons engaged in the fisheries of Alaska in 1938 was 28,084, or 2,247 less than in 1937. Fishery products were valued at $42,869,726, a decrease of $8,873,494, or 17 percent, from the value in the preceding year. Of the total amount, 91 percent represented the value of salmon products; 5 percent, herring; 2 percent, halibut; and 2 percent, the value of all other fishery products.

*Summary of persons engaged and products of the Alaska fisheries in 1938*

| Item | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Number | Value | Number | Value | Number | Value | Number | Value |
| PERSONS ENGAGED | | | | | | | | |
| Whites | 7, 312 | | 5, 305 | | 4, 167 | | 16, 784 | |
| Natives | 3, 312 | | 1, 712 | | 1, 234 | | 6, 258 | |
| Chinese | 71 | | 107 | | 194 | | 372 | |
| Japanese | 453 | | 153 | | 96 | | 702 | |
| Filipinos | 1, 241 | | 999 | | 1, 086 | | 3, 326 | |
| Mexicans | 14 | | 50 | | 329 | | 393 | |
| Puerto Ricans | | | 10 | | 77 | | 87 | |
| Kanakas | 1 | | 14 | | 21 | | 36 | |
| Negroes | 8 | | 27 | | 49 | | 84 | |
| Miscellaneous | 3 | | 12 | | 27 | | 42 | |
| Total | 12, 415 | | 8, 389 | | 7, 280 | | 28, 084 | |
| PRODUCTS | | | | | | | | |
| Salmon: | | | | | | | | |
| Canned ... cases | 2, 713, 948 | $11, 711, 803 | 2, 179, 765 | $10, 514, 492 | 1, 913, 285 | $14, 410, 602 | 6, 806, 998 | $36, 636, 897 |
| Mild cured ... pounds | 6, 344, 000 | 1, 257, 247 | 16, 800 | 1, 600 | 158, 400 | 20, 084 | 6, 519, 200 | 1, 278, 931 |
| Pickled ... do | 9, 600 | 900 | 313, 200 | 31, 228 | 854, 885 | 90, 293 | 1, 177, 685 | 122, 421 |
| Fresh, for food ... do | 3, 817, 042 | 291, 335 | | | | | 3, 817, 042 | 291, 335 |
| Frozen, for food ... do | 7, 183, 446 | 530, 891 | 1, 600 | 60 | | | 7, 185, 046 | 530, 951 |
| Frozen, for bait ... do | 720, 652 | 7, 241 | | | | | 720, 652 | 7, 241 |
| Frozen, for fur farms ... do | 61, 420 | 2, 500 | | | | | 61, 420 | 2, 500 |
| Dry-salted ... do | 10, 500 | 1, 132 | 18, 000 | 500 | 17, 300 | 1, 730 | 45, 800 | 3, 362 |
| Dried ... do | | | 4, 025 | 140 | 998, 000 | 71, 200 | 1, 002, 025 | 71, 340 |
| Eggs for fish food ... do | 7, 300 | 365 | | | | | 7, 300 | 365 |
| Fertilizer ... do | 1, 832, 000 | 27, 480 | 242, 000 | 3, 933 | | | 2, 074, 000 | 31, 413 |
| Oil ... gallons | 53, 588 | 10, 717 | 14, 400 | 5, 040 | | | 67, 988 | 15, 757 |
| Herring: | | | | | | | | |
| Fresh, for bait ... pounds | 2, 826, 404 | 37, 865 | 1, 250 | 13 | | | 2, 827, 654 | 37, 878 |
| Frozen, for bait ... do | 3, 316, 114 | 23, 924 | | | | | 3, 316, 114 | 23, 924 |
| Pickled, for food: | | | | | | | | |
| Scotch cure ... do | | | 1, 634, 000 | 97, 927 | 552, 150 | 32, 497 | 2, 186, 150 | 130, 424 |
| Norwegian cure ... do | | | | | 192, 800 | 5, 784 | 192, 800 | 5, 784 |
| Roused for food (bloater stock) ... do | | | 261, 350 | 6, 395 | 155, 550 | 6, 360 | 416, 900 | 12, 755 |
| Meal ... do | 7, 279, 394 | 132, 032 | 24, 911, 116 | 417, 582 | | | 32, 190, 510 | 549, 614 |
| Oil ... gallons | 900, 921 | 267, 021 | 3, 622, 192 | 1, 025, 684 | | | 4, 523, 113 | 1, 292, 705 |
| Halibut: | | | | | | | | |
| Fresh ... pounds | 6, 794, 439 | 429, 448 | | | | | 6, 794, 439 | 429, 448 |
| Frozen ... do | 6, 761, 916 | 460, 853 | | | | | 6, 761, 916 | 460, 853 |
| Livers ... do | 133, 000 | 66, 500 | | | | | 133, 000 | 66, 500 |
| Viscera ... do | 240, 787 | 24, 079 | | | | | 240, 787 | 24, 079 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Cod: | | | | | | | | | |
| Dry-salted | do | | | 135,119 | 6,797 | 146,019 | 8,421 | 281,138 | 15,218 |
| Stockfish | do | | | 6,126 | 796 | 552 | 82 | 6,678 | 878 |
| Tongues | do | | | 600 | 75 | 125 | 10 | 725 | 85 |
| Whale: | | | | | | | | | |
| Oil | gallons | | | | | 304,800 | 103,657 | 304,800 | 103,657 |
| Sperm oil | do | | | | | 181,900 | 54,570 | 181,900 | 54,570 |
| Meal | pounds | | | | | 1,224,000 | 21,414 | 1,224,000 | 21,414 |
| Clam: | | | | | | | | | |
| Canned | cases | 9,865 | 59,190 | 30,945 | 193,309 | 35 | 175 | 40,845 | 252,674 |
| Juice | do | 25 | 100 | | | | | 25 | 100 |
| Crab: | | | | | | | | | |
| Meat: | | | | | | | | | |
| Canned | do | 5,373 | 48,267 | 12,371 | 121,213 | | | 17,744 | 169,480 |
| Cold packed | pounds | 2,765 | 1,134 | | | | | 2,765 | 1,134 |
| In bulk | do | | | 225 | 90 | | | 225 | 90 |
| Whole in shell | dozens | 572 | 990 | 457 | 944 | | | 1,029 | 1,934 |
| Shrimp: | | | | | | | | | |
| Meat: | | | | | | | | | |
| Cold packed | pounds | 424,200 | 164,000 | 7,700 | 3,086 | | | 431,900 | 167,086 |
| Frozen | do | 3,211 | 1,284 | | | | | 3,211 | 1,284 |
| Whole in shell | do | 690 | 104 | | | | | 690 | 104 |
| Trout: | | | | | | | | | |
| Fresh | do | 50,962 | 4,534 | 1,500 | 195 | | | 52,462 | 4,729 |
| Frozen | do | 17,295 | 1,470 | 8,975 | 692 | | | 26,270 | 2,162 |
| Sablefish: | | | | | | | | | |
| Frozen | do | 776,825 | 23,499 | | | | | 776,825 | 23,499 |
| Pickled | do | 100,364 | 4,167 | | | | | 100,364 | 4,167 |
| Livers | do | 32,045 | 11,216 | | | | | 32,045 | 11,216 |
| Rockfish, frozen | do | 4,376 | 90 | | | | | 4,376 | 90 |
| Flounders: | | | | | | | | | |
| Fresh | do | 150,000 | 3,750 | | | | | 150,000 | 3,750 |
| Frozen | do | 82,145 | 3,300 | | | | | 82,145 | 3,300 |
| "Lingcod": | | | | | | | | | |
| Fresh | do | 610 | 10 | | | | | 610 | 10 |
| Livers | do | 1,544 | 618 | | | | | 1,544 | 618 |
| Total | | | 15,611,056 | | 12,431,791 | | 14,826,879 | | [1] 42,869,726 |

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[1] These figures represent the value of the manufactured product. It is estimated that the value of the catch, exclusive of whales, to the fishermen was approximately $12,040,000. Of this amount, $9,943,000 was the value of the salmon catch. The round weight of the salmon catch landed by the fishermen was approximately 589,706,000 pounds, and the corresponding figure for herring was approximately 179,735,000 pounds. The cod figures given above do not include the offshore catch from waters adjacent to Alaska, which amounted to 3,065,450 pounds of dry-salted cod and 14,325 pounds of tongues, having a total value of $130,912, landed at ports of the Pacific Coast States.

## SALMON

The commercial catch of salmon in Alaska in 1938 was somewhat smaller than that of the preceding year, although well above the general average, being the fourth largest in the history of the industry. The chief decline was in the catch of pink salmon. The number of reds and cohos, on the other hand, showed a substantial increase over 1937, with the result that there was an increase in the total volume of salmon products.

Phenomenal runs of red salmon occurred in the Bristol Bay area, and the catch was the largest ever recorded for that region. This unusual abundance was attributed in part to the fact that, during the migration of the runs from the Pacific, comparatively small catches were made on the south side of the Alaska Peninsula, where unfavorable weather conditions hampered fishing operations, particularly in the early part of the season. Although the total number of red salmon taken in central Alaska was somewhat less than in 1937, there was an increase in the pack of this species, indicating a larger average size of the fish. Among the districts which showed a gain in output of canned red salmon were the Kodiak area, Cook Inlet, and Prince William Sound. There was an increase also in the various districts of southeast Alaska, except the west coast of Prince of Wales Island.

Pink salmon were less abundant than in the 2 preceding years in each of the three major districts of Alaska, although the Prince William Sound and Cook Inlet areas showed substantial gains over the production for 1937. An increase in the catch of cohos was rather generally distributed, except that no fall fishing for this species was carried on in the Copper River and Bering River areas. Fewer chum salmon were taken than in 1937, but the volume of products showed an increase. There was a decline in both the catch and pack of king salmon.

The total catch of salmon decreased about 6 percent from that for 1937. By districts, there was a decrease of about 11 percent in southeast Alaska and 14 percent in central Alaska, while in western Alaska the catch increased 19 percent.

There was a decrease of about 20 percent in the number of fathoms of seines, and an increase of about 11 percent in the number of fathoms of gill nets used in Alaska in 1938, as compared with the previous year.

### Catch and Apparatus

The total number of seines used in the salmon industry in 1938 was 801, of which 646 were purse seines and 155 beach seines. The purse seines aggregated 97,310 fathoms of webbing, and the beach seines 14,419 fathoms. The number of gill nets used was 4,711, having a total length of 327,649 fathoms. There were 166 driven and 290 floating traps—a total of 456. This number includes 4 traps in the Chignik district that were installed merely to hold the locations, as well as several traps elsewhere in the Territory, termed "dummy" traps, the catches of which were negligible.

Southeastern Alaska was accredited with 447 seines, or a total of 73,475 fathoms, a decrease of 85 seines and 17,101 fathoms of webbing from the number used in 1937; also with 427 gill nets, aggregating 28,225 fathoms, an increase of 43 nets and 3,265 fathoms of webbing; and with 29 driven and 257 floating traps, a decrease of 3 driven traps and an increase of 5 floating traps, as compared with the number operated in 1937.

Corresponding figures for central Alaska show 350 seines, or 37,054 fathoms, as compared with 455 seines, or 46,169 fathoms, in 1937; 2,072 gill nets or 128,745 fathoms, as compared with 1,537 gill nets, or 99,570 fathoms, in 1937; and 137 driven and 33 floating traps, as compared with 138 driven and 31 floating traps in 1937.

In western Alaska 4 seines, or 1,200 fathoms of webbing, were used, a decrease of 4 seines and 1,000 fathoms of webbing from the number operated in 1937. There were 2,212 gill nets used, or an aggregate of 170,679 fathoms, an increase of 148 nets but a decrease of 802 fathoms of webbing. No traps were operated in this district.

Seines caught 22 percent of the salmon taken in 1938, gill nets 30 percent, and traps 46 percent, while lines and wheels took the remaining 2 percent.

*Salmon traps operated in Alaska in 1938*

| Licensee | Territorial License No. | Location |
|---|---|---|
| Southeast Alaska: | | |
| Independent Salmon Canneries, Inc | 38-001 | Indian Point. |
| Sebastian Stuart Fish Co | 38-002 | Point Napean. |
| Ward's Cove Packing Co | 38-010 | Cone Point. |
| Deep Sea Salmon Co | 38-011 | Union Point. |
| Do | 38-013 | Bond Bay. |
| Loveless & Sons | 38-017 | Etolin Island. |
| Do | 38-018 | Marsh Island. |
| Ward's Cove Packing Co | 38-019 | Seal Cove. |
| Brindle Trap Co | 38-020 | Duke Point. |
| Ward's Cove Packing Co | 38-021 | Gravina Island. |
| Libby, McNeill & Libby | 38-031 | Cape Fanshaw. |
| Do | 38-032 | South of Limestone Inlet. |
| Do | 38-033 | Spasskaia Bay. |
| Do | 38-034 | Do. |
| Do | 38-035 | Do. |
| Do | 38-036 | Marble Cove. |
| Do | 38-037 | False Point Pybus. |
| Do | 38-038 | Windham Bay. |
| Do | 38-039 | Northeast of Point Pybus. |
| Do | 38-040 | Do. |
| Do | 38-041 | Cape Bendel. |
| Do | 38-042 | Fanshaw Bay. |
| Do | 38-043 | Wedge Island. |
| Do | 38-044 | Cone Island. |
| Do | 38-045 | Grindall Island. |
| Do | 38-046 | Niblack Point. |
| Do | 38-047 | Smugglers Cove. |
| Do | 38-048 | Thorne Arm. |
| Do | 38-049 | Sukkwan Island. |
| Do | 38-050 | Cape Lynch. |
| Do | 38-051 | Cap Island. |
| Do | 38-053 | San Christoval Channel. |
| Do | 38-054 | Suemez Island. |
| Do | 38-055 | Fern Point. |
| Do | 38-056 | Arucenas Point. |
| Do | 38-057 | San Christoval Channel. |
| J. V. Davis | 38-060 | Cape Bendel. |
| Do | 38-061 | Naked Island. |
| Do | 38-062 | East Point. |
| Peril Straits Packing Co | 38-063 | Cosmos Cove. |
| Do | 38-064 | Marble Bluff. |
| Alaska Packers Association | 38-066 | Tree Point. |
| Fidalgo Island Packing Co | 38-084 | South of Kingsmill Point. |
| Do | 38-085 | Do. |
| Do | 38-086 | Point Ellis. |
| Do | 38-087 | South of Kingsmill Point. |
| Do | 38-088 | Kingsmill Point. |
| Do | 38-089 | Ship Island. |
| Do | 38-090 | Point Sykes. |
| Do | 38-091 | Slate Island. |
| Do | 38-092 | Onslow Island. |
| Do | 38-093 | Lucky Cove. |
| H. Bergman | 38-094 | North of Seal Cove. |

*Salmon traps operated in Alaska in 1938*—Continued

| Licensee | Territorial License No. | Location |
|---|---|---|
| Southeast Alaska—Continued. | | |
| Laura A. Houston | 38-095 | Point Higgins. |
| Peril Straits Packing Co | 38-098 | North of Fishery Point. |
| August Buschmann | 38-099 | Cape Addington. |
| Olaf A. Johnson | 38-100 | Warburton Island. |
| Peril Straits Packing Co | 38-101 | Peril Strait. |
| Do | 38-102 | North of Point Turbot. |
| Do | 38-103 | Tebenkof Bay. |
| E. R. Carlson | 38-105 | Sukkwan Island. |
| Deep Sea Salmon Co | 38-106 | Caamano Point. |
| Wm. M. Fraser | 38-107 | Steamer Rock. |
| Astoria & Puget Sound Canning Co | 38-109 | Pleasant Island. |
| Do | 38-110 | Big Porpoise Island. |
| Do | 38-111 | Point Adolphus. |
| Do | 38-112 | Do. |
| Do | 38-113 | Pleasant Island. |
| The Nakat Packing Corporation | 38-114 | Kanagunut Island. |
| Do | 38-115 | Sitklan Island. |
| Do | 38-116 | Cape Fox Island. |
| Do | 38-117 | Tree Point South. |
| Do | 38-118 | Breakwater South. |
| Do | 38-119 | Breakwater North. |
| Do | 38-120 | Niblack Point. |
| Do | 38-121 | Tolstoi Point. |
| Do | 38-122 | Meyers Chuck. |
| Do | 38-123 | Ernest Point. |
| Do | 38-124 | Eaton Point. |
| Do | 38-125 | Gravina Island. |
| Do | 38-126 | Point Webster. |
| Do | 38-127 | Sukkwan Island. |
| Do | 38-128 | Point Providence. |
| Do | 38-129 | Tranquil Point. |
| Do | 38-130 | Blanquizal Island. |
| Do | 38-131 | Steamboat Point. |
| Do | 38-132 | Point Desconocida. |
| Do | 38-133 | Derrumba Ridge, Heceta Id. |
| Arthur Gamble Co | 38-134 | Tree Point. |
| Keller Trap Co | 38-135 | Foggy Point. |
| Gravina Packing Co | 38-136 | Boat Rock. |
| Dixon Entrance Fisheries Co | 38-137 | Meyers Island. |
| August Buschmann | 38-138 | Warren Island. |
| The Nakat Packing Corporation | 38-139 | Cape Ulitka. |
| New England Fish Co | 38-141 | Point Thatcher. |
| Pacific American Fisheries, Inc | 38-142 | Kah Shakes. |
| Do | 38-143 | Do. |
| Do | 38-144 | Point Sykes. |
| Do | 38-145 | Point Alava. |
| Do | 38-146 | Lucky Cove. |
| Do | 38-147 | Betton Island. |
| Do | 38-148 | Escape Point. |
| Do | 38-149 | South Vallenar Point. |
| Do | 38-150 | Grindall Peninsula. |
| Do | 38-151 | Kanagunut Island. |
| Do | 38-152 | Grindall Point. |
| Do | 38-153 | False Island. |
| Do | 38-154 | Polk Island. |
| Do | 38-155 | Cleveland Peninsula. |
| Do | 38-156 | West of Point Nunez. |
| Do | 38-157 | Shipwreck Point. |
| Do | 38-158 | Kassa Inlet. |
| Do | 38-159 | Point Colpoys. |
| Do | 38-160 | East of Point Baker. |
| Do | 38-161 | Deepwater Point. |
| Do | 38-162 | Point Hobart. |
| Do | 38-163 | Point Brightman. |
| Do | 38-164 | North of Point Amelius. |
| Do | 38-165 | Totem Bay. |
| Do | 38-166 | East of Point Baker. |
| Do | 38-167 | Rocky Point. |
| Do | 38-168 | Point Gustavus. |
| Do | 38-169 | Dundas Bay. |
| Do | 38-170 | Dundas Point. |
| Do | 38-171 | Lemesurier Island. |
| Do | 38-172 | Eagle Point. |
| Do | 38-173 | Mansfield Peninsula. |
| Do | 38-174 | Gull Cove. |
| Security Fish Co | 38-215 | Security Cove. |
| Ira W. Kelly | 38-219 | Caamano Point. |
| Mrs. Dick Anderson | 38-220 | South of Windy Point. |
| Frank H. Murphy & Co | 38-224 | Cleveland Peninsula. |
| Peter A. Miller | 38-225 | Kasaan Bay. |

*Salmon traps operated in Alaska in 1938*—Continued

| Licensee | Territorial License No. | Location |
|---|---|---|
| Southeast Alaska—Continued. | | |
| Hood Bay Canning Co | 38-226 | Killisnoo Island. |
| P. E. Harris & Co | 38-238 | North of Hawk Inlet. |
| Do | 38-239 | Do. |
| Do | 38-240 | South of Point Marsden. |
| Do | 38-241 | North shore of Icy Strait. |
| Do | 38-242 | South of Point Augusta. |
| Do | 38-243 | North of Hawk Inlet. |
| Do | 38-244 | North of Parker Point. |
| Deep Sea Salmon Co | 38-248 | Scott Point. |
| Do | 38-249 | Rip Point. |
| Do | 38-250 | Hidden Point. |
| F. & W. Salmon Co | 38-252 | Island Point. |
| New England Fish Co | 38-257 | Carlson Cove. |
| Do | 38-258 | South Wilson Cove. |
| Do | 38-259 | Cosmos Cove. |
| Do | 38-260 | Peninsula Point. |
| Do | 38-261 | Blank Point. |
| Do | 38-262 | Bronaugh Island. |
| Do | 38-263 | Nelson Cove. |
| Do | 38-264 | South Kendrick Bay. |
| Do | 38-265 | Point Adams. |
| J. H. Rolie & Co | 38-266 | South Kendrick Bay. |
| New England Fish Co | 38-267 | St. Philip Island. |
| Do | 38-268 | Turn Point, Tuxekan Island. |
| Do | 38-269 | San Fernando Island. |
| Do | 38-270 | Cape Lynch. |
| Do | 38-271 | San Christoval Channel. |
| Do | 38-272 | St. Ignace Island. |
| Sebastian Stuart Fish Co | 38-273 | South of Point Brightman. |
| Do | 38-274 | North of Point Windham. |
| Do | 38-275 | South of Point Caution. |
| Do | 38-276 | South of Point League. |
| Do | 38-277 | East of Point Gardner. |
| Diamond K Packing Co | 38-278 | Point Amelius. |
| Ward's Cove Packing Co | 38-281 | Gravina Island. |
| Nick Bez | 38-282 | Cube Point. |
| L. P. Dawes | 38-283 | Basket Bay. |
| Brindle Trap Co | 38-284 | Flag Point. |
| D. O. Jenkins | 38-295 | South of Carroll Point. |
| Alaska Pacific Salmon Co | 38-303 | Northwest of Point Augusta Light. |
| Do | 38-304 | Point Sophia. |
| Do | 38-305 | Northwest of Rocky Island Light. |
| Do | 38-306 | West of Three Hill Island. |
| Do | 38-307 | Northwest Inian Island. |
| Do | 38-308 | Dad Rock, South Inian Pass. |
| Do | 38-309 | Northeast Inian Island. |
| Do | 38-310 | Pleasant Island. |
| Do | 38-311 | South of Point Hepburn. |
| Do | 38-312 | Point Hepburn. |
| Do | 38-313 | Village Point. |
| Do | 38-314 | Mansfield Peninsula. |
| Do | 38-315 | South of Funter Bay. |
| Do | 38-316 | North of Village Point. |
| Do | 38-317 | Northwest of Rocky Island Light. |
| Do | 38-318 | False Bay. |
| Do | 38-319 | Cube Point. |
| Do | 38-320 | Square Cove. |
| Do | 38-321 | Hawk Inlet. |
| Martin Kildall | 38-322 | Cape Decision. |
| Do | 38-323 | Northeast of Cape Decision. |
| Ketchikan Packing Co | 38-324 | Southeast of South Vallenar Pt. |
| Do | 38-325 | Do. |
| Gravina Trap Co | 38-326 | Gravina Island. |
| Eagle Trap Co | 38-327 | Percy Islands. |
| E. Dobszinsky | 38-328 | Clover Passage. |
| Alaska Pacific Salmon Co | 38-329 | Herring Bay. |
| Do | 38-330 | Point Barrie. |
| Do | 38-331 | Bean Island. |
| Lloyd Balcom | 38-334 | Island Point. |
| R. Lindenberger | 38-335 | Point Garcia. |
| Do | 38-336 | Baker Island. |
| Lynch Bros | 38-337 | North of Bond Bay. |
| Beegle Packing Co | 38-338 | South of Foggy Point. |
| Do | 38-339 | Dall Head. |
| Do | 38-340 | Cape Fox. |
| Do | 38-341 | Black Island. |
| Scow Bay Packing Co | 38-342 | East of Point Baker. |
| Do | 38-343 | West of Point Baker. |
| Do | 38-344 | North of Halibut Harbor. |
| Do | 38-345 | North of Labouchere Bay. |

*Salmon traps operated in Alaska in 1938*—Continued

| Licensee | Territorial License No. | Location |
|---|---|---|
| Southeast Alaska—Continued. | | |
| Harry Selig | 38-346 | Dall Head. |
| Gunderson & Sons | 38-394 | Screen Islands. |
| Do | 38-395 | Etolin Island. |
| Alaska Pacific Salmon Co | 38-396 | Deepwater Point. |
| Do | 38-397 | Boulder Point. |
| Do | 38-398 | Point Hobart. |
| Do | 38-399 | Northeast of Point Pybus. |
| Do | 38-400 | Canoe Point. |
| Do | 38-401 | Point Macartney. |
| Do | 38-402 | Point Brightman. |
| Do | 38-403 | Cape Fanshaw. |
| Do | 38-404 | Cornwallis Point. |
| Do | 38-405 | Southeast of Point Webster. |
| Do | 38-406 | East of Brownson Bay. |
| Do | 38-407 | McLeod Bay. |
| Do | 38-408 | Nutkwa Inlet. |
| Do | 38-409 | West of Point Nunez. |
| Do | 38-410 | Northwest of Kaigani Point. |
| Do | 38-411 | Cape Muzon. |
| Do | 38-412 | Cordova Bay. |
| Do | 38-413 | North of Cape Chacon. |
| Do | 38-414 | Ship Island. |
| Do | 38-415 | North of Cape Chacon. |
| Do | 38-416 | Gravina Island. |
| Do | 38-417 | Dall Head. |
| Do | 38-418 | Boat Harbor. |
| Do | 38-419 | Gravina Island. |
| Do | 38-420 | McLean Point. |
| Do | 38-421 | Nelson Cove. |
| Do | 38-422 | Street Island. |
| Do | 38-423 | Island Point. |
| Otto Bindpage | 38-425 | Kelp Island. |
| Superior Packing Co | 38-426 | South Passage Point. |
| Do | 38-427 | North of Parker Point. |
| Do | 38-428 | False Bay. |
| Do | 38-429 | Marble Bluff. |
| Do | 38-430 | N. W. of North Passage Point. |
| Lincoln Fisheries, Inc | 38-431 | Point Alava. |
| Do | 38-432 | Lucky Cove. |
| MacKenzie Fish Co | 38-433 | Caamano Point. |
| Otto Anderson | 38-435 | Vallenar Point. |
| C. D. Payne | 38-436 | Chasina Point. |
| Capp & Taylor Trap Co | 38-437 | Carroll Point. |
| James Taylor & Co | 38-438 | Kendrick Bay. |
| Anderson & Peterson Trap Co | 38-439 | Tongass Island. |
| Hugh Pinkerton | 38-444 | Bond Bay. |
| W. S. Balcom | 38-445 | Cape Chacon. |
| Pyramid Packing Co | 38-447 | South of Point Kakul. |
| Do | 38-448 | Bradshaw Cove. |
| Do | 38-449 | Distant Point. |
| Do | 38-450 | South of Point Kakul. |
| G. C. Foster | 38-460 | Ratz Point. |
| Wrangell Packing Co | 38-461 | Northwest of Ratz Point. |
| Do | 38-462 | Etolin Island. |
| Hood Bay Canning Co | 38-464 | Point Caution. |
| Do | 38-465 | South of Distant Point. |
| Do | 38-466 | South of Basket Bay. |
| Diamond K Packing Co | 38-467 | Northwest of Ratz Point. |
| Do | 38-468 | Narrow Point. |
| Do | 38-469 | Steamer Point. |
| Do | 38-470 | Olson Cove. |
| Do | 38-471 | Kingsmill Point. |
| Do | 38-472 | Northwest of Point Nesbitt. |
| Herbert Kittilsby | 38-473 | Observation Island. |
| Lester O. Gore | 38-474 | Brownson Bay. |
| Annette Island Canning Co., 8 traps | ---------- | Annette Island Fishery Reserve. |
| Prince William Sound: | | |
| Pacific American Fisheries, Inc | 38-175 | Point Freemantle. |
| Do | 38-176 | Point Woodcock. |
| Do | 38-177 | Graveyard Point. |
| Do | 38-178 | Bidarka Point. |
| Do | 38-179 | Bligh Island. |
| Pioneer Canneries, Inc | 38-216 | Do. |
| Do | 38-217 | North of Point Freemantle. |
| Do | 38-218 | Makaka Point. |
| Pioneer Sea Foods Co | 38-221 | Hinchinbrook Island. |
| Do | 38-222 | Do. |
| Do | 38-223 | Cedar Bay. |

*Salmon traps operated in Alaska in 1938*—Continued

| Licensee | Territorial License No. | Location |
|---|---|---|
| Prince William Sound—Continued. | | |
| Premier Salmon Co | 38-245 | Port Etches. |
| Do | 38-246 | Knowles Head. |
| Do | 38-247 | Fidalgo Bay. |
| New England Fish Co | 38-253 | Johnstone Point. |
| Do | 38-254 | Gravina Point. |
| Do | 38-255 | Hawkins Cutoff. |
| Do | 38-256 | Graveyard Point. |
| San Juan Fishing & Packing Co | 38-348 | Knight Island. |
| Do | 38-349 | McLeod Harbor. |
| Do | 38-350 | Rocky Point. |
| Do | 38-351 | Point Helen. |
| Do | 38-354 | Do. |
| Do | 38-355 | Chenega Island. |
| Do | 38-356 | Squire Island. |
| Do | 38-357 | Port Chalmers. |
| Shepard Point Packing Co | 38-362 | Shelter Bay. |
| Do | 38-363 | Red Head. |
| Do | 38-364 | Port Fidalgo. |
| Do | 38-365 | Bainbridge Island. |
| Do | 38-366 | Montague Island. |
| Do | 38-367 | Do. |
| Do | 38-368 | Do. |
| Do | 38-369 | Do. |
| Do | 38-370 | Knight Island. |
| Copper River Packing Co | 38-372 | Chenega Island. |
| Do | 38-373 | Do. |
| Do | 38-374 | Do. |
| Do | 38-375 | Do. |
| Do | 38-376 | Culross Island. |
| King & Crooker | 38-446 | Hinchinbrook Island. |
| B. E. Lee | 38-451 | Granite Bay. |
| Cook Inlet: | | |
| Libby, McNeill & Libby | 38-022 | Corea Bend. |
| Do | 38-023 | Ninilchik Point. |
| Do | 38-024 | Porcupine. |
| Do | 38-025 | Salamato. |
| Do | 38-026 | Kalifonski. |
| Do | 38-027 | Southwest of Cape Kasilof. |
| Do | 38-028 | Moose. |
| Do | 38-029 | Kustatan. |
| Do | 38-030 | Salamato. |
| Sig Lindgren | 38-058 | East shore Cook Inlet. |
| Anton Johnson and Harold Jonsson | 38-059 | Salamato Beach. |
| J. T. Hansen | 38-065 | Nikishka Bay. |
| Fidalgo Island Packing Co | 38-076 | Bluff Point. |
| Do | 38-077 | North of Salamato Creek. |
| Do | 38-078 | Do. |
| Do | 38-079 | Flat Island. |
| Do | 38-080 | South of Cape Kasilof. |
| Do | 38-082 | Nubble Point. |
| Do | 38-083 | Southwest of Point Naskowak. |
| Pacific American Fisheries, Inc | 38-180 | East shore Cook Inlet. |
| Do | 38-181 | Do. |
| Do | 38-182 | South of Salamato. |
| Do | 38-183 | North of Kenai. |
| Ninilchik Packing Co | 38-279 | Southwest of Anchor Point. |
| Do | 38-280 | Southwest of Ninilchik. |
| Paul A. Shadura | 38-285 | Kalifonski Beach. |
| Estate of J. A. Magill | 38-287 | North of Three Mile Creek. |
| Do | 38-288 | South of Three Mile Creek. |
| Axel Anderson | 38-292 | East shore Cook Inlet. |
| Tyonek Native Store Association | 38-294 | Moquawkie Reservation. |
| Alaska Year Round Canneries Co | 38-296 | Kalgin Island. |
| Do | 38-297 | Corea Bend. |
| Do | 38-298 | Clam Gulch, Kenai Peninsula. |
| Do | 38-299 | Kalgin Island. |
| Myrtle M. Everett | 38-332 | Trading Bay. |
| Do | 38-333 | Do. |
| E. J. Fribrock | 38-377 | Chisik Island. |
| Do | 38-378 | East shore Cook Inlet. |
| Do | 38-379 | Kalgin Island. |
| Do | 38-380 | East shore Cook Inlet. |
| Snug Harbor Packing Co | 38-381 | Do. |
| Do | 38-382 | Kalgin Island. |
| Do | 38-383 | Do. |
| Do | 38-384 | Point Harriet. |
| Cook Inlet Packing Co | 38-385 | North of Ninilchik River. |
| Do | 38-386 | East shore Cook Inlet. |
| Do | 38-387 | Do. |

*Salmon traps operated in Alaska in 1938*—Continued

| Licensee | Territorial License No. | Location |
|---|---|---|
| Cook Inlet—Continued. | | |
| Cook Inlet Packing Co | 38-388 | East shore Cook Inlet. |
| Do | 38-389 | Do. |
| Do | 38-390 | Do. |
| Do | 38-391 | Do. |
| Kenai River Packing Co | 38-392 | Do. |
| Do | 38-393 | Do. |
| Oscar H. Vogel | 38-424 | Point Possession. |
| Al Jones | 38-434 | West Foreland. |
| Mrs. Ero Walli | 38-452 | North of Ninilchik River. |
| W. F. Brown | 38-454 | East shore Cook Inlet. |
| H. J. Emard | 38-455 | Southwest of Moose Point. |
| Do | 38-456 | Point Possession. |
| Do | 38-457 | North of Moose Point. |
| Do | 38-458 | Moose Point. |
| Emard Packing Co | 38-459 | McManus Point. |
| Kodiak Area: | | |
| Alaska Packers Association | 38-067 | Miller Island. |
| Do | 38-068 | Alitak Bay. |
| Do | 38-069 | Deadman Bay. |
| Do | 38-073 | Uyak Bay. |
| Do | 38-074 | Do. |
| Do | 38-075 | Do. |
| Pacific American Fisheries, Inc | 38-184 | Deadman Bay. |
| Do | 38-185 | Alitak Bay. |
| Do | 38-186 | Do. |
| Do | 38-187 | Spiridon Bay. |
| Do | 38-188 | South of Cape Kuliuk. |
| San Juan Fishing & Packing Co | 38-208 | Malina Bay. |
| Do | 38-209 | Malina Point. |
| Kadiak Fisheries Co | 38-210 | Raspberry Island. |
| Do | 38-211 | Do. |
| Do | 38-212 | Do. |
| Do | 38-213 | Viekoda Bay. |
| Do | 38-214 | Raspberry Island. |
| Litnik Fish Co | 38-227 | Paramanof Bay. |
| Uganik Fisheries, Inc | 38-289 | Uganik Island. |
| Do | 38-290 | Raspberry Island. |
| Do | 38-291 | Uganik Island. |
| Bellarmine Corporation | 38-293 | Do. |
| San Juan Fishing & Packing Co | 38-352 | South of Broken Point. |
| Do | 38-353 | Uganik Island. |
| Ottar Hofstad | 38-359 | Cape Uyak. |
| Do | 38-360 | Cape Ugat. |
| Chignik Area: | | |
| Columbia River Packers Association | 38-014 | Chignik Bay, near Anchorage Bay. |
| Do | 38-015 | Aniakchak Bay. |
| Do | 38-016 | Lake Bay. |
| Alaska Packers Association | 38-070 | Main Island, Chignik Lagoon. |
| Do | 38-071 | West end of Chignik Bay. |
| Do | 38-072 | Cape Kumlik. |
| Pacific American Fisheries, Inc | 38-189 | Chignik Lagoon, Humes Point. |
| Do | 38-190 | Hook Bay. |
| Alaska Peninsula Area: | | |
| Alaska Southern Packing Co | 38-096 | Fox Cape. |
| Do | 38-097 | Kupreanof Point. |
| Pacific American Fisheries, Inc | 38-191 | Kelly Rock, Unga Island. |
| Do | 38-192 | Pinnacle, Unga Island. |
| Do | 38-193 | Seal Cape. |
| Do | 38-195 | Ikatan Bay. |
| Do | 38-196 | Do. |
| Do | 38-197 | Do. |
| Do | 38-198 | Do. |
| Do | 38-199 | Morzhovoi Bay. |
| Do | 38-200 | Vodapoini Point. |
| Do | 38-201 | Nikolaski, Moss Cape. |
| Do | 38-202 | Deer Island. |
| Do | 38-203 | Long John, North of Arch Point. |
| Do | 38-204 | Swedania Point. |
| Do | 38-205 | Dolgoi Island. |
| Do | 38-206 | Cape Tolstoi. |
| D. Hotovitzky | 38-207 | Bold Cape. |
| P. E. Harris & Co | 38-230 | Cape Horn. |
| Do | 38-231 | East Anchor Cove. |
| Do | 38-232 | Ikatan Bay. |
| Do | 38-233 | Do. |
| Do | 38-234 | Arch Point. |
| Do | 38-235 | Pavlof Bay. |
| Do | 38-236 | Do. |
| Do | 38-237 | Moss Cape. |

*Salmon traps operated in Alaska in 1938*—Continued

| Licensee | Territorial License No. | Location |
|---|---|---|
| Alaska Peninsula Area—Continued. | | |
| Korovin Island Fishing & Canning Co | 38-300 | Korovin Island. |
| Alaska Pacific Salmon Co | 38-301 | Popof Island. |
| Mrs. Helene R. Mellick | 38-302 | Do. |
| Aleutian Fishing & Packing Co | 38-358 | San Diego, west of Guillemot Id. |
| Blue Fox Fish Co | 38-440 | Popof Island. |

*Summary of traps operated in Alaska in 1938, by districts*

| District | Number | District | Number |
|---|---|---|---|
| Southeast Alaska | 286 | Central Alaska—Continued. | |
| Central Alaska: | | Chignik Area | 8 |
| Prince William Sound | 42 | Alaska Peninsula Area | 31 |
| Cook Inlet | 62 | Total, Central Alaska | 170 |
| Kodiak Area | 27 | Grand total | 456 |

*Percentage of salmon caught in each Alaska district, by principal forms of apparatu*

| Apparatus | Southeast Alaska | | Central Alaska | | Western Alaska | |
|---|---|---|---|---|---|---|
| | 1937 | 1938 | 1937 | 1938 | 1937 | 1938 |
| Seines | 29 | 27 | 39 | 32 | 4 | 3 |
| Gill nets | 3 | 2 | 8 | 10 | 95 | 96 |
| Traps | 65 | 67 | 53 | 58 | | |
| Lines | 3 | 4 | | | | |
| Wheels | | | | | 1 | 1 |

The total catch of salmon in 1938 was 103,022,897, a decrease of 6,092,026, or about 6 percent, from the number taken in 1937. There was a decrease of 4,852,027 in southeast and 5,755,644 in central Alaska, and an increase of 4,515,645 in the western district. By species, the catch of cohos increased 1,062,707 and reds 4,377,102; while the catch of chums decreased 410,521, pinks 10,977,246, and kings 144,068.

*Salmon taken in 1938, by apparatus and species, in each geographic section of Alaska*

| Apparatus and species | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| Seines: | | | | |
| Coho, or silver | 242,402 | 99,448 | | 341,850 |
| Chum, or keta | 2,433,122 | 1,153,296 | 53,975 | 3,640,393 |
| Pink, or humpback | 7,459,317 | 8,971,618 | | 16,430,935 |
| King, or spring | 21,439 | 1,252 | 5,857 | 28,548 |
| Red, or sockeye | 610,486 | 872,245 | 837,342 | 2,320,073 |
| Total | 10,766,766 | 11,097,859 | 897,174 | 22,761,799 |
| Gill nets: | | | | |
| Coho, or silver | 257,742 | 192,940 | 6,785 | 457,467 |
| Chum, or keta | 25,888 | 128,868 | 972,231 | 1,126,987 |
| Pink, or humpback | 85,140 | 771,686 | 1,936 | 858,762 |
| King, or spring | 22,702 | 50,067 | 63,545 | 136,314 |
| Red, or sockeye | 528,428 | 2,369,431 | 25,469,437 | 28,367,296 |
| Total | 919,900 | 3,512,992 | 26,513,934 | 30,946,826 |

*Salmon taken in 1938, by apparatus and species, in each geographic section of Alaska*—Continued

| Apparatus and species | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| Traps: | | | | |
| Coho, or silver | 910, 015 | 530, 395 | | 1, 440, 410 |
| Chum, or keta | 2, 097, 384 | 1, 372, 829 | | 3, 470, 213 |
| Pink, or humpback | 22, 743, 783 | 15, 164, 598 | | 37, 908, 381 |
| King, or spring | 7, 124 | 30, 393 | | 37, 517 |
| Red, or sockeye | 1, 396, 503 | 3, 250, 171 | | 4, 646, 674 |
| Total | 27, 154, 809 | 20, 348, 386 | | 47, 503, 195 |
| Lines: | | | | |
| Coho, or silver | 789, 466 | 1, 100 | | 790, 566 |
| King, or spring | 705, 852 | | | 705, 852 |
| Total | 1, 495, 318 | 1, 100 | | 1, 496, 418 |
| Wheels: | | | | |
| Chum, or keta | | | 292, 400 | 292, 400 |
| King, or spring | | | 19, 459 | 19, 459 |
| Red, or sockeye | | | 2, 800 | 2, 800 |
| Total | | | 314, 659 | 314, 659 |
| Total: | | | | |
| Coho, or silver | 2, 199, 625 | 823, 883 | 6, 785 | 3, 030, 293 |
| Chum, or keta | 4, 556, 394 | 2, 654, 993 | 1, 318, 606 | 8, 529, 993 |
| Pink, or humpback | 30, 288, 240 | 24, 907, 902 | 1, 936 | 55, 198, 078 |
| King, or spring | 757, 117 | 81, 712 | 88, 861 | 927, 690 |
| Red, or sockeye | 2, 535, 417 | 6, 491, 847 | 26, 309, 579 | 35, 336, 843 |
| Grand total | 40, 336, 793 | 34, 960, 337 | 27, 725, 767 | 103, 022, 897 |

## CANNING

### CHANGES IN CANNERIES

Few changes in business organization and operations were reported for 1938 in the Alaska salmon-canning industry. In southeast Alaska the plant of the Demmert Packing Co. at Klawak, which had been idle in the previous year, was taken over and operated by a new concern, the Spencer Packing Corp. The plant of the Nakat Packing Corp. at Hidden Inlet was again in operation, having been rebuilt since its destruction by fire in the spring of 1937.

In central Alaska the San Juan Fishing & Packing Co. purchased the Drier Bay cannery from the Alaska Pacific Salmon Co. and dismantled it during the season. The cannery of Herbert T. Domenici at Uyak, which was idle in 1937, was taken over and operated by a new organization, the Great Northern Packing Co., Inc. The Shepard Point Packing Co. used its plant at Port Ashton both for salmon canning and for herring operations, but did not operate the cannery at Shepard Point. The Kadiak Fisheries Co. completed construction of its new modern cannery at Port Bailey, about 40 miles northwest of Kodiak, in time for operation in the 1938 season. This plant was built to replace the company's cannery at Kodiak. The Anchor Line Packing Co., formerly operating a floating plant at Seldovia, established and operated a small shore cannery on Kenai River.

At the beginning of the year the Bristol Bay Packing Co. was merged into the Alaska Salmon Co., which operated only the Kvichak River plant during the season. The company's Wood River cannery was used as a saltery, and the second Kvichak River plant, to replace buildings of the Bristol Bay Packing Co. destroyed by fire in 1936,

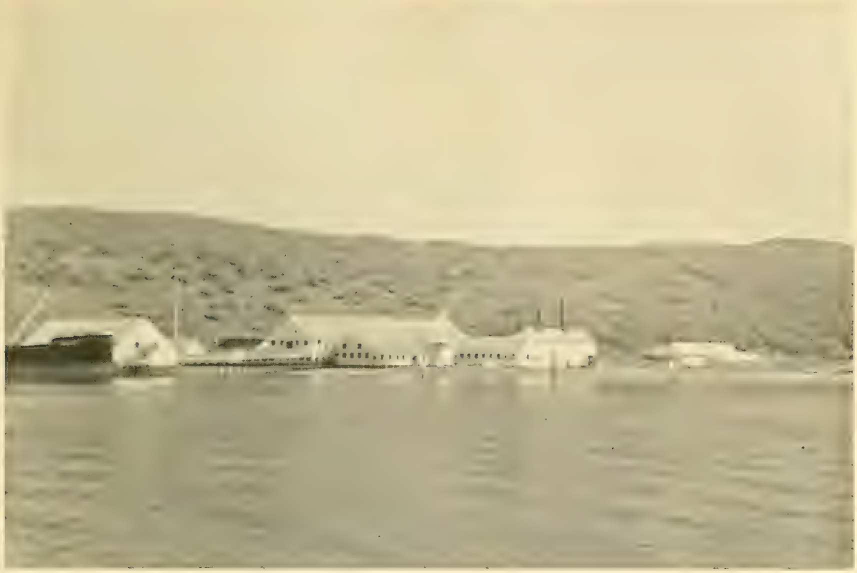

FIGURE 1.—Typical Alaska salmon cannery.

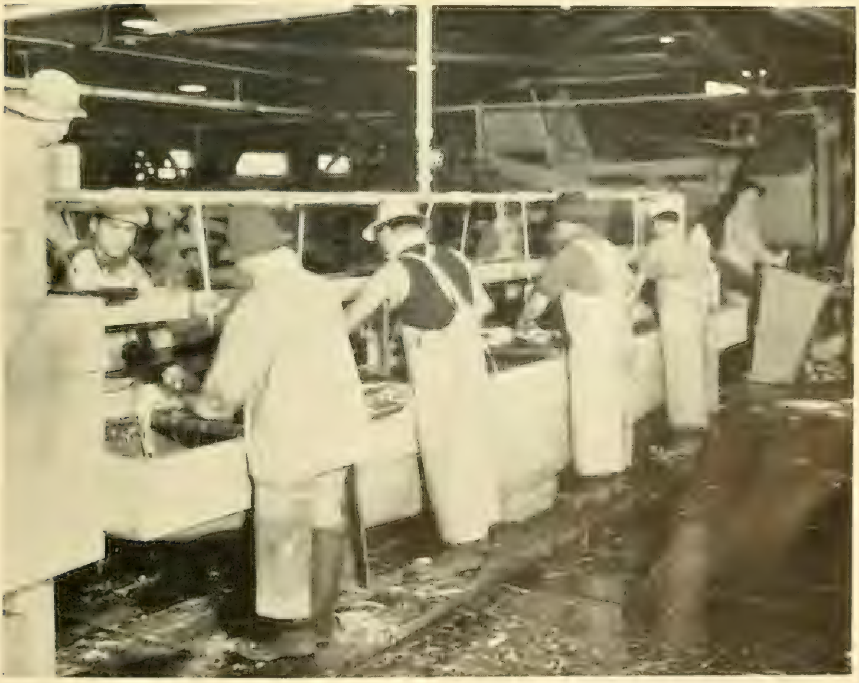

FIGURE 2.—Completing the cleaning operation, Alaska salmon cannery.

was not completed until after the close of the fishing season. The floating plant *La Merced*, of the Alaska Southern Packing Co., operated at Uyak Bay, Kodiak Island, during part of the season, but most of its pack was prepared in the Bristol Bay district, operations being carried on at Ships Anchorage in Kvichak Bay.

### NEW CANNERIES

Aside from the replacement of certain canneries by new establishments, as mentioned above, there was only one new salmon cannery in Alaska during the season. This was a floating plant operated by Lars Sagen on a small scow at Crescent River, Tuxedna Harbor. Scotty's Packing Co., at Mummy Island, which had previously engaged in the packing of clams and crabs, added canned salmon to its production this season and is included for the first time in the list of salmon canneries.

The Salt Sea Fisheries put up a small pack of salmon, as well as crab meat, at its hand cannery at Tenakee, but this is not included in the list of salmon canneries.

### CANNERIES NOT OPERATED

Largely as a result of prolonged labor negotiations in the spring, which resulted in undue delay in preparation for the season's activities, several canneries did not open, and the total number operated was the smallest for any year since 1933.

Of the canneries in southeast Alaska that were operated in the previous year, the following stood idle in 1938: Berg Packing Co., Ketchikan; Deep Sea Salmon Co., Skowl Arm; Hood Bay Canning Co., Hood Bay; Hydaburg Fisheries, Inc., Hydaburg; New England Fish Co., Chatham; Pyramid Packing Co., Inc., Sitka; and Red Salmon Packers Association, Yakutat. The plant of the Kayler-Otness Co., which was burned down in the fall of 1937, was rebuilt but did not pack salmon in 1938, its operations being confined to crabs and shrimp. The Pacific American Fisheries, Inc., used its plant at Kasaan solely for canning clams that were obtained from the beaches at Massett, B. C.

In central Alaska, plants that were closed for the 1938 season were the King Cove cannery of the Pacific American Fisheries, Inc., the company's catch in this region being put up by P. E. Harris & Co. at False Pass under a joint operating agreement; the Shepard Point cannery of Shepard Point Packing Co.; the Phillips Canning Corporation at Valdez; the Zachar Bay cannery of Shelikof Packing Co., which had been leased to the Kadiak Fisheries Co. in 1937; and the Shearwater Bay plant of Kadiak Fisheries Co., all canning operations of this concern being carried on at its new plant at Port Bailey, which replaces the company's plant at Kodiak. The Kodiak cannery has been discontinued, and all the machinery has been removed. The cannery of A. N. Nilson at Portlock was destroyed by fire during the winter of 1937–38 and was not rebuilt.

The Nushagak and Ugashik plants of the Alaska Packers Association and the Wood River plant of Alaska Salmon Co. were engaged only in the production of pickled salmon in 1938. Other canneries in the western district that had operated in the previous year but were closed in 1938 were the Nushagak and Port Moller plants of Pacific

American Fisheries, Inc., and the floating plant of Western Pacific Packing Co., Egegik River.

The following plants have been dropped from the list of inactive canneries, as they have been dismantled or abandoned and are not likely to be reopened: Alaska Packers Association, Loring, Wrangell, and Kasilof; Alaska Sanitary Packing Co., Cape Fanshaw; Anderson Mercantile Co., Inc., Deep Creek; W. G. Culver, Point McManus; General Fish Co., Ocean Dock, Anchorage; Gustan & Vogel, Point Possession; Libby, McNeill & Libby, Klawak; the Nakat Packing Corporation, Ketchikan; North Coast Packing Co., Ninilchik; Pacific American Fisheries, Inc., Excursion Inlet, Ketchikan, Port Walter, Santa Ana, Chignik, and Unakwik Inlet; Point Possession Fish Co., Point Possession; Redoubt Bay Packing Co., Redoubt Bay; Harvey J. Smith, West Foreland; Spur Fish Corporation, Nikishka Bay; Sunset Packing Co., Otter Creek; John Wik, Kenai; Jake Young, Port Chatham; E. Sandvik, Swansons Creek; and San Juan Fishing & Packing Co., Drier Bay (formerly owned by Alaska Pacific Salmon Co.). The plant of E. Sandvik at Swansons Creek is now being used for pickling salmon.

The following canneries were closed during the year but may be reopened:

Southeast Alaska:

| | |
|---|---|
| Alaska Pacific Salmon Co | Boca de Quadra.<br>Chomly.<br>Funter Bay.<br>Pybus Bay. |
| Berg Packing Co | Ketchikan. |
| Deep Sea Salmon Co | Skowl Arm. |
| Hood Bay Canning Co | Hood Bay. |
| Hydaburg Fisheries, Inc | Hydaburg. |
| Lane Bros | Moira Sound. |
| New England Fish Co | Chatham. |
| Pyramid Packing Co | Sitka. |
| Red Salmon Packers Association | Yakutat (floating). |
| Seaport Salmon Co | Ketchikan. |
| Karl Thiele | Lake Bay. |

Central Alaska:

| | |
|---|---|
| Alaska Packers Association | Chignik. |
| Aleutian Fishing & Packing Co | Sand Point. |
| Glacier Sea Foods Co | Cordova. |
| Kadiak Fisheries Co | Shearwater Bay. |
| Ninilchik Packing Co | Ninilchik. |
| Pacific American Fisheries, Inc | Kenai.<br>King Cove. |
| Phillips Canning Corporation | Valdez. |
| Premier Salmon Co | Stevens Creek. |
| Shelikof Packing Co | Zachar Bay. |
| Shepard Point Packing Co | Shepard Point. |

Western Alaska:

| | |
|---|---|
| Alaska Packers Association | Naknek River.<br>Nushagak Bay.<br>Ugashik River. |
| Alaska Salmon Co | Wood River. |
| Herendeen Bay Consolidated Canneries | Herendeen Bay. |
| Libby, McNeill & Libby | Lockanok.<br>Nushagak. |
| Pacific American Fisheries, Inc | Nushagak River (2).<br>Port Moller. |
| Red Salmon Canning Co | Naknek River. |
| Western Pacific Packing Co | Egegik River (floating). |

## TOTAL CANNERIES OPERATED

Ninety-eight canneries were operated in Alaska in 1938—39 in southeastern, 41 in central, and 18 in western Alaska—which is a decrease from the previous year of 7 for the southeastern, 3 for the central, and 5 for the western district. The floating canneries *International*, of the International Packing Co., *Memnon*, of the Columbia River Packers Association, Inc., and *La Merced*, of the Alaska Southern Packing Co., Inc., were operated in both central and western Alaska, but each is credited to only one district, the *International* to central and the other two to western Alaska.

Companies that operated traps only, the catches of which were sold or packed by other companies under joint operating arrangements, have been omitted from the following list, although for a number of years they have been included.

*Companies that canned salmon in Alaska, number and location of canneries operated, and number of traps owned by each, 1938* [1]

[New canneries indicated by asterisk (*)]

| Company | Canneries | | Traps | | |
|---|---|---|---|---|---|
| | Number | Location | Driven | Floating | Total |
| Southeast Alaska: | | | | | |
| Alaska Pacific Salmon Co | 4 | Kake | | 11 | 11 |
| | | Ketchikan | 3 | 7 | 10 |
| | | Port Althorp | | 19 | 19 |
| | | Rose Inlet | | 9 | 9 |
| Annette Island Canning Co | 1 | Metlakatla | 1 | 7 | 8 |
| A R B Packing Co | 1 | Wrangell | | | |
| Balcom-Payne Fisheries, Inc | 1 | Ketchikan | | | |
| Beegle Packing Co | 1 | do | 2 | 4 | 6 |
| Burnett Inlet Salmon Co | 1 | Burnett Inlet | | | |
| Consolidated Fisheries | 1 | Excursion Inlet | 3 | 10 | 13 |
| Diamond K Packing Co | 1 | Wrangell | 2 | 6 | 8 |
| Douglas Fisheries Co., Inc | 1 | Douglas | | | |
| Fidalgo Island Packing Co | 2 | Bay of Pillars | 5 | | 5 |
| | | Ketchikan | 2 | 3 | 5 |
| Haines Packing Co | 1 | Letnikof Cove | | | |
| P. E. Harris & Co | 1 | Hawk Inlet | | 7 | 7 |
| Icy Straits Salmon Co | 1 | Hoonah | | | |
| Independent Salmon Canneries, Inc | 1 | Ketchikan | | 1 | 1 |
| Ketchikan Packing Co | 1 | do | | 2 | 2 |
| Libby, McNeill & Libby | 4 | Craig | | 8 | 8 |
| | | George Inlet | | 7 | 7 |
| | | Taku Harbor | 5 | 10 | 15 |
| | | Yakutat | | | |
| Lindenberger Packing Co | 1 | Craig | | | |
| Nakat Packing Corp., The | 3 | Hidden Inlet | | 6 | 6 |
| | | Union Bay | | 5 | 5 |
| | | Waterfall | | 9 | 9 |
| New England Fish Co | 2 | Ketchikan | | 5 | 5 |
| | | Noyes Island | | 6 | 6 |
| Northern Fisheries, Inc | 1 | Ketchikan | | | |
| Ocean Packing Co | 1 | Klawak | | | |
| Pacific American Fisheries, Inc | 1 | Petersburg | 3 | 4 | 7 |
| Peril Straits Packing Co | 1 | Todd | | 7 | 7 |
| Scow Bay Packing Co | 1 | Scow Bay | | 4 | 4 |
| Sebastian Stuart Fish Co | 1 | Tyee | | 6 | 6 |
| Spencer Packing Corp | 1 | Klawak | | | |
| Superior Packing Co | 1 | Tenakee | | 5 | 5 |
| Ward's Cove Packing Co | 1 | Ward Cove | | 3 | 3 |
| Wrangell Packing Co | 1 | Wrangell | | 2 | 2 |
| Central Alaska: | | | | | |
| Alaska Native Consolidated Canning Co. | 1 | Sand Point | | | |
| Alaska Pacific Salmon Co | 1 | do | 3 | | 3 |
| Alaska Packers Association | 2 | Chignik | 3 | | 3 |
| | | Larsen Bay | 3 | | 3 |
| Alaska Red Salmon Packers, Inc | 1 | Halibut Bay (Carmel) | | | |
| Alaska Southern Packing Co | 1 | Uyak Bay (floating) | | | |
| Alaska Year-Round Canneries Co | 1 | Seldovia | 4 | | 4 |

See footnotes at end of table.

*Companies that canned salmon in Alaska, number and location of canneries operated, and number of traps owned by each, 1938*—Continued

| Company | Canneries | | Traps | | |
|---|---|---|---|---|---|
| | Number | Location | Driven | Floating | Total |
| Central Alaska—Continued. | | | | | |
| Anchor Line Packing Co | 1 | Kenai River | | | |
| Chignik Packing Co | 1 | Chignik | | | |
| Columbia River Packers Association, Inc. | 1 | Ikatan Bay (floating) | | | |
| Cook Inlet Packing Co | 1 | Seldovia | 7 | | 7 |
| Copper River Packing Co | 1 | McClure Bay | | 5 | 5 |
| Emard Packing Co | 1 | Anchorage | 5 | | 5 |
| Fidalgo Island Packing Co | 1 | Port Graham | 7 | | 7 |
| General Fish Co., Inc | 1 | Anchorage | 3 | | 3 |
| W. R. Gilbert Co., Inc | 1 | Point Whitshed | | | |
| Great Northern Packing Co., Inc | 1 | Uyak Bay | | | |
| Grimes Packing Co | 1 | Uzinki | | | |
| Gulf Packing Co | 1 | Cordova [2] | | | |
| Hagen & Co | 1 | Seward | | | |
| P. E. Harris & Co | 1 | False Pass | 8 | | 8 |
| International Packing Co | 1 | Ikatan, Ivanof, and Volcano Bays (floating). | | | |
| Kadiak Fisheries Co | 1 | Port Bailey | 5 | 1 | 6 |
| Libby, McNeill & Libby | 1 | Kenai | 10 | | 10 |
| Frank McConaghy Co., Inc | 1 | Kodiak (floating) | | | |
| New England Fish Co | 1 | Cordova | 4 | | 4 |
| North Pacific Sea Foods Co | 1 | Swanport | | | |
| Pacific American Fisheries, Inc | 2 | Alitak | 6 | | 6 |
| | | Squaw Harbor | 4 | | 4 |
| Pioneer Canneries, Inc | 1 | Cordova | 2 | 1 | 3 |
| Pioneer Sea Foods Co., The | 1 | Orca | | 3 | 3 |
| Puget and Alaska Canning Co | 1 | Seldovia | | | |
| Lars Sagen | 1 | Crescent River (floating).* | | | |
| Sandvik Hand Cannery | 1 | Uganik Village | | | |
| San Juan Fishing & Packing Co | 2 | Port San Juan | 2 | 6 | 8 |
| | | Uganik Bay | 4 | | 4 |
| Scotty's Packing Co | 1 | Mummy Island [2] | | | |
| Shepard Point Packing Co | 1 | Port Ashton | | 9 | 9 |
| Snug Harbor Packing Co | 1 | Snug Harbor | 8 | | 8 |
| Suryan's, Inc | 1 | Moser Bay (floating) | | | |
| Uganik Fisheries, Inc | 1 | Uganik | 3 | | 3 |
| L. Utness | 1 | Mountain Slough | | | |
| Washington Fish & Oyster Co., Inc | 1 | Port Williams | | | |
| Western Alaska: | | | | | |
| Alaska Packers' Association | 5 | Egegik River | | | |
| | | Kvichak Bay (2) | | | |
| | | Naknek River (2) | | | |
| Alaska Salmon Co | 1 | Kvichak River | | | |
| Alaska Southern Packing Co., Inc | 1 | Naknek (floating) | | | |
| Columbia River Packers' Association, Inc. | 2 | Nushagak | | | |
| | | Port Moller (floating) | | | |
| International Packing Co | 1 | Port Moller (floating) | | | |
| Libby, McNeill & Libby | 4 | Egegik River | | | |
| | | Ekuk | | | |
| | | Koggiung | | | |
| | | Libbyville | | | |
| Nakat Packing Corporation, The | 1 | Nakeen | | | |
| Pacific American Fisheries, Inc | 2 | Naknek River | | | |
| Red Salmon Canning Co | 2 | Naknek River | | | |
| | | Ugashik River | | | |

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[1] A list of all traps operated in Alaska in 1938 appears on pp. 115 to 121 of this report.
[2] Primarily a clam cannery.

## LOSSES AND DISASTERS

Property losses reported for the Alaska fisheries in 1938 amounted to $110,235, of which $45,338 represented the value of some 5,000 cases of canned red salmon lost with a lighter of the Alaska Packers Association in Kvichak Bay, and $21,000 was the value of a shipment of empty cans lost while being conveyed to the floating cannery of Suryan's, Inc. The remainder consisted chiefly of small boats and fishing apparatus. The total reported losses in southeast Alaska amounted to $22,985; those in the central district, $34,058; and in western Alaska, $53,192.

Other losses are known to have occurred, of which records are incomplete. One small cannery, that of A. N. Nilson, at Portlock, was destroyed by fire in the winter of 1937–38, but no information is available as to its value.

The most serious disaster was the loss of the purse-seine boat *Eidsvold*, with the entire crew, somewhere in the vicinity of Dall Island.

Thirty-one lives were lost during the year—14 in southeast, 10 in central, and 7 in western Alaska. In the southeastern district 7 fishermen were drowned, 3 shoresmen and 1 transporter met death in accidents, and 2 shoresmen and 1 transporter died of disease. Two fishermen, 3 shoresmen, and 1 transporter were drowned in central Alaska, 1 fisherman and 2 shoresmen died of disease, and 1 shoresman committed suicide. In western Alaska 2 fishermen were drowned and 1 fisherman, 3 shoresmen and 1 transporter died of disease.

## STATISTICS

Ninety-eight canneries were operated in Alaska in 1938, or 15 less than in the previous year. Employment was given to 22,280 persons, as compared with 24,865 in 1937, a decrease of 2,585. White employees decreased 806, natives 536, Chinese 179, Japanese 254, Filipinos 548, Mexicans 243, Puerto Ricans 3, and miscellaneous 44; while Kanakas increased 20 and Negroes 8.

The total pack of canned salmon was 6,806,998 cases, valued at $36,636,897. This is an increase of 2 percent in quantity but a decrease of about 18 percent in value from the production in 1937, when the pack amounted to 6,669,665 cases, valued at $44,547,769. Average prices of all species were considerably lower in 1938 than in the previous year.

The output of canned salmon in southeast Alaska decreased from 2,933,896 cases in 1937 to 2,713,948 cases in 1938, or 7 percent; in central Alaska the decline was from 2,216,359 cases to 2,179,765 cases, or about 2 percent; while in western Alaska the output increased from 1,519,410 cases to 1,913,285 cases, or about 26 percent. By species, in Alaska as a whole, the pack of cohos increased from 137,317 cases in 1937 to 222,321 cases in 1938, or about 62 percent; chums, from 730,832 cases to 786,753 cases, or about 8 percent; and reds from 2,106,669 cases to 2,521,233 cases, or about 20 percent; while the pack of pinks decreased from 3,625,379 cases to 3,232,878 cases, or about 11 percent; and kings from 69,468 cases to 43,813 cases, or about 37 percent.

Details are included in the following tables to show comparison of the 1938 pack with the average for the 5 preceding years, 1933 to 1937, by cases of each species and by districts. Cohos and reds show gains of 17 percent and 23 percent, respectively, over the 5-year average, while chums declined about 4 percent, pinks 7 percent, and kings 13 percent. By districts, the pack in 1938 increased approximately 2 percent over the 5-year average in central Alaska and about 41 percent in the western district, while in southeast Alaska there was a decrease of 12 percent, making a net increase of 3 percent over the 5-year average for all of Alaska.

*Persons engaged, wages paid, and operating units of Alaska salmon canning industry, 1938*

| Item | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| PERSONS ENGAGED | | | | |
| Fishermen: | | | | |
| Whites | 1,471 | 1,513 | 1,891 | 4,875 |
| Natives | 1,235 | 805 | 235 | 2,275 |
| Japanese | | 1 | | 1 |
| Filipinos | 6 | 3 | | 9 |
| Mexicans | 2 | | 1 | 3 |
| Kanakas | | 2 | | 2 |
| Negroes | 2 | | | 2 |
| Miscellaneous [1] | 2 | | | 2 |
| Total | 2,718 | 2,324 | 2,127 | 7,169 |
| Shoresmen: | | | | |
| Whites | 2,275 | 1,934 | 1,616 | 5,825 |
| Natives | 1,615 | 763 | 104 | 2,482 |
| Chinese | 70 | 103 | 194 | 367 |
| Japanese | 437 | 151 | 96 | 684 |
| Filipinos | 1,213 | 971 | 1,082 | 3,266 |
| Mexicans | 6 | 50 | 324 | 380 |
| Puerto Ricans | | 10 | 77 | 87 |
| Kanakas | 1 | 5 | 21 | 27 |
| Negroes | 6 | 26 | 46 | 78 |
| Miscellaneous [1] | 1 | 11 | 27 | 39 |
| Total | 5,624 | 4,024 | 3,587 | 13,235 |
| Transporters: | | | | |
| Whites | 807 | 574 | 419 | 1,800 |
| Natives | 10 | 43 | | 53 |
| Chinese | 1 | 4 | | 5 |
| Filipinos | 1 | | 1 | 2 |
| Mexicans | | | 4 | 4 |
| Kanakas | | 7 | | 7 |
| Negroes | | 1 | 3 | 4 |
| Miscellaneous [1] | | 1 | | 1 |
| Total | 819 | 630 | 427 | 1,876 |
| Total: | | | | |
| Whites | 4,553 | 4,021 | 3,926 | 12,500 |
| Natives | 2,860 | 1,611 | 339 | 4,810 |
| Chinese | 71 | 107 | 194 | 372 |
| Japanese | 437 | 152 | 96 | 685 |
| Filipinos | 1,220 | 974 | 1,083 | 3,277 |
| Mexicans | 8 | 50 | 329 | 387 |
| Puerto Ricans | | 10 | 77 | 87 |
| Kanakas | 1 | 14 | 21 | 36 |
| Negroes | 8 | 27 | 49 | 84 |
| Miscellaneous [1] | 3 | 12 | 27 | 42 |
| Grand total | 9,161 | 6,978 | 6,141 | 22,280 |
| Wages paid shoresmen | $1,629,510 | $1,488,601 | $1,729,144 | $4,847,255 |
| Wages paid transporters | $434,873 | $367,664 | $289,455 | $1,091,992 |
| OPERATING UNITS | | | | |
| Plants: | | | | |
| Shore canneries | 39 | 37 | 16 | 92 |
| Floating canneries— | | | | |
| Power vessels | | 2 | 2 | 4 |
| Net tonnage | | 2,366 | 4,092 | 6,458 |
| Scows | | 2 | | 2 |
| Total plants operated | 39 | 41 | 18 | 98 |
| Vessels: | | | | |
| Power, over 5 tons | 495 | 183 | 73 | 751 |
| Net tonnage | 9,310 | 4,903 | 21,278 | 35,491 |
| Launches | 115 | 244 | 18 | 377 |
| Power dories | 31 | 118 | 32 | 181 |
| Gill-net boats | 103 | 332 | 943 | 1,378 |
| Seine skiffs | 273 | 279 | 4 | 556 |
| Other rowboats and skiffs | 586 | 593 | 149 | 1,328 |
| Lighters and scows | 196 | 201 | 121 | 518 |
| Houseboats | 23 | 2 | 23 | 48 |
| Pile drivers | 24 | 33 | 11 | 68 |
| Pile pullers | 3 | 8 | | 11 |
| Rigging scows | 32 | 10 | | 42 |

[1] Koreans, Chileans, Peruvians, etc.

*Persons engaged, wages paid, and operating units of Alaska salmon canning industry, 1938*—Continued

| Item | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| Apparatus: | | | | |
| Purse seines | 421 | 221 | 4 | 646 |
| Fathoms | 71, 595 | 24, 515 | 1, 200 | 97, 310 |
| Beach seines | 26 | 109 | | 135 |
| Fathoms | 1, 880 | 11, 012 | | 12, 892 |
| Gill nets | 422 | 2, 031 | 1, 523 | 3, 976 |
| Fathoms | 28, 075 | 126, 930 | 150, 435 | 305, 440 |
| Traps, driven | 29 | 137 | | 166 |
| Traps, floating | 257 | 33 | | 290 |

*Output and value of canned salmon in Alaska in 1938* [1]

| Product | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Cases | Value | Cases | Value | Cases | Value | Cases | Value |
| Coho, or silver: | | | | | | | | |
| ½-pound flat | 8, 930 | $84, 746 | 3, 092 | $27, 921 | | | 12, 022 | $112, 667 |
| 1-pound flat | 2, 688 | 18, 816 | 157 | 1, 072 | | | 2, 845 | 19, 888 |
| 1-pound tall | 132, 147 | 807, 301 | 69, 839 | 428, 613 | 345 | $1, 937 | 202, 331 | 1, 237, 851 |
| 4-pound flat | | | 5, 123 | 28, 905 | | | 5, 123 | 28, 905 |
| Total | 143, 765 | 910, 863 | 78, 211 | 486, 511 | 345 | 1, 937 | 222, 321 | 1, 399, 311 |
| Chum, or keta: | | | | | | | | |
| ½-pound flat | 5, 147 | 28, 969 | 376 | 2, 105 | | | 5, 523 | 31, 074 |
| 1-pound tall | 469, 306 | 1, 681, 816 | 250, 046 | 907, 034 | 59, 614 | 216, 171 | 778, 966 | 2, 805, 021 |
| 4-pound flat | | | 2, 264 | 7, 328 | | | 2, 264 | 7, 328 |
| Total | 474, 453 | 1, 710, 785 | 252, 686 | 916, 467 | 59, 614 | 216, 171 | 786, 753 | 2, 843, 423 |
| Pink, or humpback: | | | | | | | | |
| ½-pound flat | 41, 691 | 250, 497 | 9, 091 | 57, 515 | | | 50, 782 | 308, 012 |
| 1-pound flat | | | 4, 105 | 18, 317 | | | 4, 105 | 18, 317 |
| 1-pound tall | 1, 845, 078 | 7, 094, 557 | 1, 318, 415 | 5, 006, 070 | | | 3, 163, 493 | 12, 100, 627 |
| 4-pound flat | | | 14, 498 | 54, 767 | | | 14, 498 | 54, 767 |
| Total | 1, 886, 769 | 7, 345, 054 | 1, 346, 109 | 5, 136, 669 | | | 3, 232, 878 | 12, 481, 723 |
| King, or spring: | | | | | | | | |
| ½-pound flat | 1, 279 | 13, 325 | 1, 075 | 17, 390 | | | 2, 354 | 30, 715 |
| 1-pound flat | 1, 450 | 11, 890 | 4, 381 | 40, 887 | 280 | 2, 580 | 6, 111 | 55, 357 |
| 1-pound tall | 13, 641 | 93, 458 | 15, 488 | 103, 975 | 6, 219 | 45, 138 | 35, 348 | 242, 571 |
| Total | 16, 370 | 118, 673 | 20, 944 | 162, 252 | 6, 499 | 47, 718 | 43, 813 | 328, 643 |
| Red, or sockeye: | | | | | | | | |
| ½-pound flat | 53, 802 | 598, 554 | 50, 618 | 578, 628 | 18, 222 | 216, 029 | 122, 642 | 1, 393, 211 |
| 1-pound flat | 13, 247 | 116, 386 | 38, 361 | 318, 542 | | | 51, 608 | 434, 928 |
| 1-pound tall | 125, 542 | 911, 488 | 384, 267 | 2, 850, 896 | 1, 828, 605 | 13, 928, 747 | 2, 338, 414 | 17, 691, 131 |
| 4-pound flat | | | 8, 569 | 64, 527 | | | 8, 569 | 64, 527 |
| Total | 192, 591 | 1, 626, 428 | 481, 815 | 3, 812, 593 | 1, 846, 827 | 14, 144, 776 | 2, 521, 233 | 19, 583, 797 |
| Grand total | 2, 713, 948 | 11, 711, 803 | 2, 179, 765 | 10, 514, 492 | 1, 913, 285 | 14, 410, 602 | 6, 806, 998 | 36, 636, 897 |

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[1] For the purpose of affording fair comparison, all cases are put upon the common basis of 48 1-pound cans per case.

*Output of canned salmon in Alaska, in cases, 1933 to 1938* [1]

BY SPECIES

| Product | 1933 | 1934 | 1935 | 1936 | 1937 | Average for 5-year period, 1933–37 | 1938 | Percentage increase or decrease in 1938, as compared with 5-year average |
|---|---|---|---|---|---|---|---|---|
| Coho, or silver: | | | | | | | | |
| ½-pound flat | 3, 367 | 5, 785 | 6, 822 | 7, 309 | 9, 625 | 6, 582 | 12, 022 | +82. 65 |
| 1-pound flat | 4, 657 | 8, 283 | 2, 833 | 1, 335 | 1, 204 | 3, 662 | 2, 845 | −22. 31 |
| 1-pound tall | 154, 544 | 222, 049 | 180, 522 | 213, 656 | 123, 610 | 178, 876 | 202, 331 | +13. 11 |
| 4-pound flat | | | | | 2, 878 | 576 | 5, 123 | +789. 41 |
| Total | 162, 568 | 236, 117 | 190, 177 | 222, 300 | 137, 317 | 189, 696 | 222, 321 | +17. 20 |
| Chum, or keta: | | | | | | | | |
| ½-pound flat | 658 | 2, 298 | 1, 647 | 1, 500 | 5, 883 | 2, 397 | 5, 523 | +130. 41 |
| 1-pound flat | | | | | 39 | 8 | | −100. 00 |
| 1-pound tall | 658, 131 | 738, 343 | 851, 281 | 1, 099, 583 | 723, 815 | 814, 231 | 778, 966 | −4. 33 |
| 4-pound flat | | | | | 1, 095 | 219 | 2, 264 | +933. 79 |
| Total | 658, 789 | 740, 641 | 852, 928 | 1, 101, 083 | 730, 832 | 816, 855 | 786, 753 | −3. 69 |
| Pink, or humpback: | | | | | | | | |
| ½-pound flat | 14, 857 | 28, 793 | 44, 560 | 37, 406 | 33, 338 | 31, 791 | 50, 782 | +59. 74 |
| 1-pound flat | | 1, 668 | 687 | | 438 | 558 | 4, 105 | +635. 66 |
| 1-pound tall | 2, 167, 694 | 3, 793, 732 | 3, 198, 819 | 4, 522, 388 | 3, 586, 905 | 3, 453, 908 | 3, 163, 493 | −8. 41 |
| 4-pound flat | | | | | 4, 698 | 939 | 14, 498 | +1, 443. 98 |
| Total | 2, 182, 551 | 3, 824, 193 | 3, 244, 066 | 4, 559, 794 | 3, 625, 379 | 3, 487, 196 | 3, 232, 878 | −7. 29 |
| King, or spring: | | | | | | | | |
| ½-pound flat | 9, 955 | 9, 983 | 13, 462 | 10, 388 | 15, 495 | 11, 857 | 2, 354 | −80. 15 |
| 1-pound flat | 10, 021 | 10, 214 | 6, 520 | 5, 722 | 6, 213 | 7, 738 | 6, 111 | −21. 03 |
| 1-pound tall | 21, 437 | 32, 666 | 16, 423 | 35, 774 | 47, 760 | 30, 812 | 35, 348 | +14. 72 |
| Total | 41, 413 | 52, 863 | 36, 405 | 51, 884 | 69, 468 | 50, 407 | 43, 813 | −13. 08 |
| Red, or sockeye: | | | | | | | | |
| ½-pound flat | 53, 638 | 88, 051 | 87, 498 | 137, 219 | 149, 424 | 103, 166 | 122, 642 | +18. 88 |
| 1-pound flat | 60, 052 | 73, 430 | 57, 693 | 118, 090 | 87, 654 | 79, 384 | 51, 608 | −34. 99 |
| 1-pound tall | 2, 066, 593 | 2, 466, 535 | 664, 355 | 2, 247, 233 | 1, 866, 176 | 1, 862, 178 | 2, 338, 414 | +25. 57 |
| 4-pound flat | | | | | 3, 415 | 683 | 8, 569 | +1, 154. 61 |
| Total | 2, 180, 283 | 2, 628, 016 | 809, 546 | 2, 502, 542 | 2, 106, 669 | 2, 045, 411 | 2, 521, 233 | +23. 26 |
| Grand total | 5, 225, 604 | 7, 481, 830 | 5, 133, 122 | 8, 437, 603 | 6, 669, 665 | 6, 589, 565 | 6, 806, 998 | +3. 30 |

BY DISTRICTS AND SPECIES

| Product | 1933 | 1934 | 1935 | 1936 | 1937 | Average for 5-year period, 1933–37 | 1938 | Percentage increase or decrease in 1938, as compared with 5-year average |
|---|---|---|---|---|---|---|---|---|
| Southeast Alaska: | | | | | | | | |
| Coho, or silver | 95, 805 | 158, 527 | 142, 493 | 134, 722 | 88, 525 | 124, 014 | 143, 765 | +15. 93 |
| Chum, or keta | 424, 861 | 394, 212 | 540, 948 | 778, 339 | 503, 766 | 528, 425 | 474, 453 | −10. 21 |
| Pink, or humpback | 1, 478, 013 | 2, 622, 362 | 2, 200, 060 | 2, 925, 144 | 2, 143, 168 | 2, 273, 750 | 1, 886, 769 | −17. 02 |
| King, or spring | 8, 146 | 15, 594 | 11, 108 | 20, 505 | 30, 693 | 17, 209 | 16, 370 | −4. 88 |
| Red, or sockeye | 81, 126 | 104, 398 | 159, 429 | 218, 007 | 167, 744 | 146, 141 | 192, 591 | +31. 78 |
| Total | 2, 087, 951 | 3, 295, 093 | 3, 054, 038 | 4, 076, 717 | 2, 933, 896 | 3, 089, 539 | 2, 713, 948 | −12. 16 |
| Central Alaska: | | | | | | | | |
| Coho, or silver | 65, 307 | 76, 371 | 47, 461 | 86, 007 | 48, 654 | 64, 760 | 78, 211 | +20. 77 |
| Chum, or keta | 207, 879 | 313, 233 | 302, 123 | 296, 188 | 191, 610 | 262, 207 | 252, 686 | −3. 63 |
| Pink, or humpback | 704, 538 | 1, 199, 872 | 1, 044, 002 | 1, 603, 584 | 1, 482, 210 | 1, 206, 841 | 1, 346, 109 | +11. 54 |
| King, or spring | 23, 786 | 28, 472 | 24, 462 | 27, 073 | 31, 644 | 27, 087 | 20, 944 | −22. 68 |
| Red, or sockeye | 484, 484 | 709, 470 | 384, 183 | 856, 829 | 462, 241 | 579, 442 | 481, 815 | −16. 85 |
| Total | 1, 485, 994 | 2, 327, 418 | 1, 802, 231 | 2, 869, 681 | 2, 216, 359 | 2, 140, 337 | 2, 179, 765 | +1. 84 |
| Western Alaska: | | | | | | | | |
| Coho, or silver | 1, 456 | 1, 219 | 223 | 1, 571 | 138 | 921 | 345 | −62. 54 |
| Chum, or keta | 26, 049 | 33, 196 | 9, 857 | 26, 556 | 35, 456 | 26, 223 | 59, 614 | +127. 33 |
| Pink, or humpback | | 1, 959 | 4 | 31, 066 | 1 | 6, 606 | | −100. 00 |
| King, or spring | 9, 481 | 8, 797 | 835 | 4, 306 | 7, 131 | 6, 110 | 6, 499 | +6. 37 |
| Red, or sockeye | 1, 614, 673 | 1, 814, 148 | 265, 934 | 1, 427, 706 | 1, 476, 684 | 1, 319, 829 | 1, 846, 827 | +39. 93 |
| Total | 1, 651, 659 | 1, 859, 319 | 276, 853 | 1, 491, 205 | 1, 519, 410 | 1, 359, 689 | 1, 913, 285 | +40. 71 |
| Grand total | 5, 225, 604 | 7, 481, 830 | 5, 133, 122 | 8, 437, 603 | 6, 669, 665 | 6, 589, 565 | 6, 806, 998 | +3. 30 |

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[1] The number of cases has been put upon the common basis of 48 1-pound cans per case.

*Relative importance of each species of canned salmon within each district in 1938*

| District | Coho | Chum | Pink | King | Red | Total, all species |
|---|---|---|---|---|---|---|
| | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* |
| Southeast Alaska | 5.3 | 17.5 | 69.5 | 0.6 | 7.1 | 100.0 |
| Central Alaska | 3.6 | 11.6 | 61.7 | 1.0 | 22.1 | 100.0 |
| Western Alaska | .0 | 3.1 | .0 | .4 | 96.5 | 100.0 |
| All Alaska | 3.3 | 11.6 | 47.5 | .6 | 37.0 | 100.0 |

*Relative importance of each district in the production of each species of salmon canned in 1938*

| District | Coho | Chum | Pink | King | Red | Total, all species |
|---|---|---|---|---|---|---|
| | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* |
| Southeast Alaska | 64.7 | 60.3 | 58.4 | 37.4 | 7.6 | 39.9 |
| Central Alaska | 35.2 | 32.1 | 41.6 | 47.8 | 19.1 | 32.0 |
| Western Alaska | .1 | 7.6 | .0 | 14.8 | 73.3 | 28.1 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

*Average annual price per case of 48 1-pound cans of salmon, 1928 to 1938*

| Product | 1928 | 1929 | 1930 | 1931 | 1932 | 1933 | 1934 | 1935 | 1936 | 1937 | 1938 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Coho, or silver | $7.12 | $7.59 | $8.26 | $6.51 | $4.12 | $5.20 | $5.23 | $6.40 | $6.51 | $8.14 | $6.29 |
| Chum, or keta | 6.06 | 5.35 | 3.60 | 3.19 | 2.79 | 4.12 | 3.65 | 3.83 | 3.58 | 4.62 | 3.61 |
| Pink, or humpback | 6.56 | 6.06 | 4.17 | 3.46 | 3.14 | 4.52 | 4.10 | 4.14 | 3.94 | 4.95 | 3.86 |
| King, or spring | 11.13 | 11.92 | 13.32 | 9.40 | 5.46 | 7.51 | 6.85 | 8.70 | 7.95 | 9.94 | 7.50 |
| Red, or sockeye | 9.41 | 10.71 | 12.57 | 9.20 | 5.61 | 6.71 | 6.72 | 9.32 | 8.38 | 10.12 | 7.77 |

## PACK IN CERTAIN DISTRICTS

Statistics of the salmon pack are again presented for subdivisions of the three main districts of Alaska, and comparison is made with similar statistics for 1937. Where the pack at a given cannery is made up of fish from more than one district, as in the case of that at certain Cordova canneries packing fish caught both in Prince William Sound and in the Copper River area, or at various plants in southeastern Alaska which draw for their supply on the catch of more than one district, due segregation has been made in order to credit each district with the pack from salmon caught therein. These districts are described as follows:

### WESTERN ALASKA

*Bristol Bay.*—The Bering Sea shore, east and north of the Ugashik River.

*Port Moller and Herendeen Bay.*—Port Moller, Herendeen Bay, and Nelson Lagoon.

### CENTRAL ALASKA

*Ikatan-Shumagin Islands.*—False Pass, Ikatan Bay, King Cove, and the Shumagin Islands.

*Chignik.*—Mainland shore from Castle Cape to Cape Kunmik.

*Kodiak-Afognak Islands.*—Kodiak, Spruce, and Raspberry Islands.

*Cook Inlet.*—The shores of Cook Inlet.

*Prince William Sound.*—Resurrection Bay to Point Whitshed.

*Copper and Bering Rivers.*—Point Whitshed to Bering River.

SOUTHEASTERN ALASKA

*Yakutat and Dry Bay.*—Yakutat Bay to and including Dry Bay.

*Icy Strait-Lynn Canal.*—West coast of Baranof and Chichagof Islands, the shores of Cross Sound, Icy Strait, Lynn Canal, and Stephens Passage, south to Taku Harbor.

*Chatham Strait-Frederick Sound.*—Both shores of Chatham Strait and its bays from Point Augusta to Cape Ommaney, and through Frederick Sound and its bays northward to Taku Harbor, including Kake.

*Sumner Strait-Dixon Entrance.*—Southward from Petersburg and eastward from Port Beauclerc to Cape Chacon and Dixon Entrance, and including all shores along the mainland and intervening islands from the Stikine River to Portland Canal.

*West coast, Prince of Wales Island.*—Territory west and south of a line from Cape Chacon to Point Baker and Cape Ommaney.

*Pack of canned salmon in Alaska in 1938, by districts* [1]

| District | Coho | Chum | Pink | King | Red | Total | Percentage increase or decrease from 1937 |
|---|---|---|---|---|---|---|---|
| | *Cases* | *Cases* | *Cases* | *Cases* | *Cases* | *Cases* | |
| Bristol Bay | 345 | 54,551 | ---------- | 5,446 | 1,772,885 | 1,833,227 | +25.76 |
| Port Moller and Herendeen Bay | ---------- | 5,063 | ---------- | 1,053 | 73,942 | 80,058 | +29.71 |
| Ikatan-Shumagin Islands | 21,650 | 128,574 | 367,827 | 1,655 | 57,439 | 577,145 | −13.86 |
| Chignik | 2,254 | 6,792 | 12,071 | 148 | 35,147 | 56,412 | −53.88 |
| Kodiak-Afognak Islands | 14,716 | 69,792 | 450,098 | 316 | 142,112 | 677,034 | −27.48 |
| Cook Inlet | 32,745 | 16,260 | 54,894 | 16,060 | 170,725 | 290,684 | +59.14 |
| Prince William Sound | 6,846 | 31,218 | 461,114 | 251 | 10,615 | 510,044 | +131.65 |
| Copper and Bering Rivers | ---------- | 50 | 105 | 2,514 | 65,777 | 68,446 | −21.84 |
| Yakutat and Dry Bay | 26,854 | 397 | 7,417 | 1,450 | 27,211 | 63,329 | +63.57 |
| Icy Strait-Lynn Canal | 18,363 | 87,263 | 245,556 | 3,917 | 70,078 | 425,177 | −8.35 |
| Chatham Strait-Frederick Sound | 19,083 | 93,879 | 373,982 | 1,348 | 13,346 | 501,638 | −30.31 |
| Sumner Strait-Dixon Entrance | 48,169 | 212,578 | 912,747 | 585 | 60,956 | 1,235,035 | +5.75 |
| West Coast, Prince of Wales Island | 31,296 | 80,336 | 347,067 | 9,070 | 21,000 | 488,769 | −10.09 |
| Total | 222,321 | 786,753 | 3,232,878 | 43,813 | 2,521,233 | 6,806,998 | +2.06 |

[1] Pack reduced to the basis of forty-eight 1-pound cans per case.

*Canneries operated in Alaska in 1938, by districts*

| District | Canneries located in district | Canneries handling salmon taken in district |
|---|---|---|
| | *Number* | *Number* |
| Bristol Bay | [1] 17 | 17 |
| Port Moller and Herendeen Bay | [2] 2 | 2 |
| Ikatan-Shumagin Islands | [2] 6 | 7 |
| Chignik | 2 | 2 |
| Kodiak-Afognak Islands | [1] 13 | 14 |
| Cook Inlet | 10 | 11 |
| Prince William Sound | 11 | 10 |
| Copper and Bering Rivers | 1 | 7 |
| Yakutat and Dry Bay | 1 | 1 |
| Icy Strait-Lynn Canal | 7 | 12 |
| Chatham Strait-Frederick Sound | 5 | 15 |
| Sumner Strait-Dixon Entrance | 19 | 22 |
| West Coast, Prince of Wales Island | 7 | 16 |
| Total (without duplication) | 98 | ---------- |

[1] Number includes 1 floating plant that was operated in more than 1 district.
[2] Number includes 2 floating plants that were operated in more than 1 district.

### MILD CURING

Notwithstanding a considerable decrease in the number of troll-caught king salmon in southeast Alaska, the production of mild-cured salmon showed a marked increase over that of the preceding year. The increase was both for kings and for cohos, but chiefly the latter, which made up a larger portion of the pack than for any other year since 1929. The total output was the second largest in the history of the industry, having been exceeded only by the pack in 1927. As usual, the bulk of the product was from southeast Alaska, with a limited supply also from the western and central districts.

No enumeration of trolling boats was made by the Bureau in 1938, as no patrol vessel was available for this work at the beginning of the season. In respect to the number of fishermen, boats, and lines in southeast Alaska, therefore, the same figures are used as for the preceding year. In order to enable the securing of more accurate data regarding trolling operations in the future, it is the purpose to embody in the Alaska fishery regulations a requirement that before the commencement of commercial fishing each season the name and number of each trolling boat shall be furnished to the Bureau's local representative.

Twenty-one plants were operated in 1938 and 1,753 persons were employed, as compared with 17 plants and 1,605 persons in the previous year. There was also some production of mild-cured salmon incidental to canning and other operations.

The total output of mild-cured salmon was 6,519,200 pounds, valued at $1,278,931, an increase of 797,600 pounds in quantity and $214,587 in value over the production in 1937.

*Persons engaged, wages paid, and operating units, Alaska salmon mild-curing industry, 1938*

| Item | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| PERSONS ENGAGED | | | | |
| Fishermen: | | | | |
| Whites | 1,078 | 1 | 2 | 1,081 |
| Natives | 239 | 2 | 23 | 264 |
| Total | 1,317 | 3 | 25 | 1,345 |
| Shoresmen: | | | | |
| Whites | 338 | ------------ | ------------ | 338 |
| Natives | 27 | ------------ | 27 | 54 |
| Total | 365 | ------------ | 27 | 392 |
| Transporters: | | | | |
| Whites | 14 | ------------ | ------------ | 14 |
| Natives | ------------ | ------------ | 2 | 2 |
| Total | 14 | ------------ | 2 | 16 |
| Grand total | 1,696 | 3 | 54 | 1,753 |
| Wages paid shoresmen | $170,146 | ------------ | $3,473 | $173,619 |
| Wages paid transporters | $10,512 | ------------ | $300 | $10,812 |
| OPERATING UNITS | | | | |
| Plants: | | | | |
| Shore | 15 | 1 | 2 | 18 |
| Floating: | | | | |
| Barges | 2 | ------------ | ------------ | 2 |
| Net tonnage | 300 | ------------ | ------------ | 300 |
| Scow | ------------ | ------------ | 1 | 1 |
| Total plants operated | 17 | 1 | 3 | 21 |

*Persons engaged, wages paid, and operating units, Alaska salmon mild-curing industry, 1938*—Continued

| Item | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| Vessels: | | | | |
| Power, over 5 tons | 259 | 1 | 3 | 263 |
| Net tonnage | 2,241 | 14 | 43 | 2,298 |
| Launches | 651 | | 1 | 652 |
| Power dory | | | 1 | 1 |
| Gill-net boats | | | 9 | 9 |
| Rowboats and skiffs | 150 | | 3 | 153 |
| Lighters and scows | 2 | | 1 | 3 |
| Houseboat | 1 | | | 1 |
| Apparatus: | | | | |
| Gill nets | | 1 | 21 | 22 |
| Fathoms | | 100 | 1,053 | 1,153 |
| Lines | 3,718 | 4 | | 3,722 |
| Wheels | | | 3 | 3 |

*Products of Alaska salmon mild-curing industry in 1938*

| Products | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Coho, or silver | [1] 793,600 | $103,218 | [2] 16,800 | $1,600 | | | [3] 810,400 | $104,818 |
| King, or spring | [4] 5,550,400 | 1,154,029 | | | [5] 158,400 | $20,084 | [6] 5,708,800 | 1,174,113 |
| Total | 6,344,000 | 1,257,247 | 16,800 | 1,600 | 158,400 | 20,084 | 6,519,200 | 1,278,931 |

[1] 992 tierces. [2] 21 tierces. [3] 1,013 tierces. [4] 6,938 tierces. [5] 198 tierces. [6] 7,136 tierces.

## PICKLING

The output of pickled salmon in Alaska showed a marked increase over that for 1937, reaching the highest level for any year since 1926. This increase may be attributed primarily to the excellent runs of red salmon in the Bristol Bay district and to the fact that certain plants there did not engage in canning operations, owing to the undue delay in preparation for the season's activities by reason of unsettled labor conditions. Canneries that were used solely for pickling salmon were the Alaska Salmon Co.'s plant at Wood River, and the Nushagak and Ugashik plants of the Alaska Packers Association. A number of small outfits also engaged in the industry, and some pickled salmon was packed in connection with salmon canning and other branches of the fisheries.

Of the total output, 72 percent was prepared in western Alaska, about 27 percent in the central district, and somewhat less than 1 percent in the southeastern district.

There were 217 persons employed, an increase of 96 over the number reported for 1937. The total output was 1,177,685 pounds, valued at $122,421, as compared with 765,396 pounds, valued at $100,550, in the previous year.

*Persons engaged, wages paid, and operating units, Alaska salmon-pickling industry, 1938*

| Item | Central Alaska | Western Alaska | Total |
|---|---|---|---|
| PERSONS ENGAGED | | | |
| Fishermen: | | | |
| Whites | 31 | 40 | 71 |
| Natives | 8 | 58 | 66 |
| Total | 39 | 98 | 137 |
| Shoresmen: | | | |
| Whites | 1 | 36 | 37 |
| Natives | 2 | 38 | 40 |
| Filipinos | | 3 | 3 |
| Total | 3 | 77 | 80 |
| Grand total | 42 | 175 | 217 |
| Wages paid shoresmen | $718 | $13,496 | $14,214 |
| OPERATING UNITS | | | |
| Plants: | | | |
| Shore | 26 | 8 | 34 |
| Floating—scows | 2 | | 2 |
| Total plants operated | 28 | 8 | 36 |
| Vessels: | | | |
| Power, over 5 tons | 1 | 8 | 9 |
| Net tonnage | 5 | 1,314 | 1,319 |
| Launches | 7 | 1 | 8 |
| Power dories | 12 | | 12 |
| Gill-net boats | 3 | 63 | 66 |
| Seine skiffs | 1 | 1 | 2 |
| Other rowboats and skiffs | 29 | 63 | 92 |
| Lighters and scows | 2 | 12 | 14 |
| Houseboats | | 3 | 3 |
| Pile drivers | | 3 | 3 |
| Apparatus: | | | |
| Beach seines | 19 | | 19 |
| Fathoms | 1,452 | | 1,452 |
| Gill nets | 39 | 81 | 120 |
| Fathoms | 1,665 | 4,645 | 6,310 |

*Products of Alaska salmon-pickling industry in 1938*

| Products | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Coho, or silver | 3,000 | $240 | 109,900 | $8,870 | 1,570 | $236 | 114,470 | $9,346 |
| Chum, or keta | | | 600 | 30 | 27,700 | 1,734 | 28,300 | 1,764 |
| Pink, or humpback | | | 1,600 | 110 | 4,100 | 264 | 5,700 | 374 |
| King, or spring | | | 8,600 | 1,222 | 23,300 | 2,448 | 31,900 | 3,670 |
| Red, or sockeye | 6,600 | 660 | 192,500 | 20,996 | 798,215 | 85,611 | 997,315 | 107,267 |
| Total | 9,600 | 900 | 313,200 | 31,228 | 854,885 | 90,293 | 1,177,685 | 122,421 |

## FRESH SALMON

As in the previous year, the fresh-salmon business was confined to southeast Alaska, where it was largely incidental to other branches of the fisheries. Three dealers whose chief output was fresh salmon gave employment to 10 white shoresmen. The total products amounted to 3,817,042 pounds, valued at $291,335, as compared with 3,421,129 pounds, valued at $292,316, in 1937—an increase of about 12 percent in quantity, but a decrease of about a third of 1 percent in value. The foregoing output includes approximately 35,600 chum salmon, or 308,200 pounds, that were taken in Cholmondeley Sound during the fall season and shipped to a salmon cannery at Anacortes, Wash.

*Products of Alaska fresh-salmon industry in 1938*

| Species | Pounds | Value |
|---|---|---|
| Coho, or silver | 1,322,327 | $95,427 |
| Chum, or keta | 635,719 | 12,366 |
| Pink, or humpback | 12,925 | 355 |
| King, or spring | 1,648,326 | 166,412 |
| Red, or sockeye | 197,745 | 16,775 |
| Total | 3,817,042 | 291,335 |

## FREEZING

The production of frozen salmon in Alaska, most of which was incidental to mild curing and other branches of the fisheries, was substantially larger in 1938 than in the preceding year. Ninety-nine white shoresmen, not elsewhere recorded, were identified with this industry, receiving wages amounting to $49,926. Except for a small output incidental to trout operations at Seward, in the central district, the entire production was from southeast Alaska. The total output was 7,185,046 pounds valued at $530,951, as compared with 5,344,666 pounds valued at $431,614 in 1937—an increase of 34 percent in quantity and 23 percent in value.

Frozen salmon used as bait in the halibut fishery or as animal feed on fur farms are not included in the above figures but are shown under miscellaneous salmon products.

*Products of Alaska frozen-salmon industry in 1938*

| Species | Pounds | Value |
|---|---|---|
| Coho, or silver | 4,910.565 | $357,875 |
| Chum, or keta | 636,444 | 20,553 |
| Pink, or humpback | 61,020 | 2,441 |
| King, or spring | 1,573,089 | 149,621 |
| Red, or sockeye | 3,928 | 461 |
| Total | 7,185,046 | 530,951 |

## DRY-SALTED, DRIED, AND OTHER MISCELLANEOUS SALMON PRODUCTS

An outfit in southeast Alaska and one in the central district reported the dry-salting of salmon. Employment was given to 2 whites and 4 natives, respectively, and the output of dry-salted salmon amounted to 10,500 pounds, valued at $1,132, in southeast Alaska, and 18,000 pounds, valued at $500, in central Alaska. Other miscellaneous products in southeast Alaska consisted of 720,652 pounds of frozen salmon for bait, valued at $7,241; 61,420 pounds of frozen salmon for use as animal feed on fur farms, valued at $2,500; and 7,300 pounds of salmon eggs, valued at $365, which were shipped in brine to Seattle for use in specially prepared fish food. An output of 4,025 pounds of dried salmon, valued at $140, was reported for central Alaska.

Miscellaneous fishery products of the Yukon, Tanana, and Kuskokwim Rivers were 17,300 pounds of dry-salted salmon, valued at $1,730, and 998,000 pounds of dried salmon, valued at $71,200. Nine whites and 710 natives engaged in the fishery, and the apparatus used consisted of 238 wheels, 587 gill nets of 14,546 fathoms, 2 dories, and 50 rowboats and skiffs.

*Production of dry-salted, dried, and other miscellaneous salmon products in Alaska in 1938*

| Products | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Dry-salted: | | | | | | | | |
| Coho, or silver | 630 | $51 | 18,000 | $500 | ---------- | -------- | 18,630 | $551 |
| King, or spring | ---------- | -------- | ---------- | -------- | 17,300 | $1,730 | 17,300 | 1,730 |
| Red, or sockeye | 9,870 | 1,081 | ---------- | -------- | ---------- | -------- | 9,870 | 1,081 |
| Total | 10,500 | 1,132 | 18,000 | 500 | 17,300 | 1,730 | 45,800 | 3,362 |
| Dried: | | | | | | | | |
| Chum, or keta | ---------- | -------- | 1,025 | 50 | 912,000 | 66,900 | 913,025 | 66,950 |
| Pink, or humpback | ---------- | -------- | 3,000 | 90 | ---------- | -------- | 3,000 | 90 |
| King, or spring | ---------- | -------- | ---------- | -------- | 44,000 | 2,200 | 44,000 | 2,200 |
| Red, or sockeye | ---------- | -------- | ---------- | -------- | 42,000 | 2,100 | 42,000 | 2,100 |
| Total | ---------- | -------- | 4,025 | 140 | 998,000 | 71,200 | 1,002,025 | 71,340 |
| Frozen for bait: | | | | | | | | |
| Coho, or silver | 9,273 | 128 | ---------- | -------- | ---------- | -------- | 9,273 | 128 |
| Chum, or keta | 630,146 | 6,301 | ---------- | -------- | ---------- | -------- | 630,146 | 6,301 |
| Pink, or humpback | 79,028 | 790 | ---------- | -------- | ---------- | -------- | 79,028 | 790 |
| Red, or sockeye | 2,205 | 22 | ---------- | -------- | ---------- | -------- | 2,205 | 22 |
| Total | 720,652 | 7,241 | ---------- | -------- | ---------- | -------- | 720,652 | 7,241 |
| Frozen for feed on fur farms: | | | | | | | | |
| Pink, or humpback | 61,420 | 2,500 | ---------- | -------- | ---------- | -------- | 61,420 | 2,500 |
| Salmon eggs for fish food | 7,300 | 365 | ---------- | -------- | ---------- | -------- | 7,300 | 365 |
| Grand total | 799,872 | 11,238 | 22,025 | 640 | 1,015,300 | 72,930 | 1,837,197 | 84,808 |

## BYPRODUCTS

Salmon meal and oil were prepared at a byproducts plant in southeast Alaska, and at a salmon cannery on Larsen Bay, in the central district, in connection with its canning operations. The average number of employees at the former plant was 24 white shoresmen, although approximately three times that number of persons were identified with the industry for varying periods, due to changes in the crews supplied through union hiring halls at different times during the season.

The total production in 1938 was 2,074,000 pounds of fertilizer, valued at $31,413, and 67,988 gallons of oil, valued at $15,757, as compared with 1,972,000 pounds of fertilizer, valued at $29,151, and 78,100 gallons of oil, valued at $23,956, in 1937—an increase of 5 percent in the output of fertilizer, and a decrease of about 13 percent in the output of oil.

## HERRING

As in the previous year, little attention was given to the production of Scotch-cured herring in Alaska in 1938, primarily because of unfavorable market conditions. No pickled herring whatever was reported for southeastern Alaska and the pack in the central district was somewhat curtailed, while in the western district there was a considerable increase, with the result that the total output of Scotch-cured herring in the Territory was slightly larger than that for 1937. Of this output, 552,150 pounds, or 25 percent, came from the western district, while Prince William Sound produced 784,500 pounds and the Kodiak area 849,500 pounds, or 36 percent and 39 percent of the total, respectively.

Herring for bait showed a slight increase, although a shortage during the winter months made it necessary to import a supply of frozen herring from Prince Rupert.

A sharp curtailment in the production of herring meal and oil in southeast Alaska was partly offset by increases in the Prince William Sound area, but the total output of these products was considerably less than that of the preceding year. There were 17,720,922 pounds of meal and 2,406,822 gallons of oil produced in the Prince William Sound area, or about 55 percent and 53 percent, respectively, of the entire output of meal and oil in Alaska. The Kodiak area accounted for 7,190,194 pounds of meal and 1,215,370 gallons of oil, or 22 percent and 27 percent of the total, respectively, while southeast Alaska produced the remaining 7,279,394 pounds of meal and 900,921 gallons of oil, representing 23 percent and 20 percent of the total of these respective products. As in the preceding year, the figures indicate a relatively high oil content for the herring in the Kodiak area.

It was reported that the herring in the Kodiak area in 1938 arrived later than in the previous year, but finally appeared in large quantities. Most of the fishing in that district was again carried on in the vicinity of Cape Ugat and Uyak Bay.

Nineteen concerns handled herring in southeast Alaska, including 6 cold-storage plants that froze herring for bait and 8 outfits engaged solely in the production of bait herring. Five reduction plants, or 3 less than in the preceding year, were operated in the district, as follows:

| | |
|---|---|
| Arentsen & Co | Big Port Walter. |
| Atlas Packing Corporation | Deep Cove. |
| Buchan & Heinen Packing Co | Port Armstrong. |
| Northwestern Herring Co | Port Conclusion. |
| Storfold & Grondahl Packing Co | Washington Bay. |

In central Alaska nine plants manufactured herring oil and meal, a decrease of one from the number operated in the preceding year. Four of these plants also packed Scotch-cured herring and two produced some bloater stock. In addition, a small quantity of the Scotch-cured product was prepared in connection with salmon pickling in the Kodiak area. W. J. Imlach succeeded the Evans Bay Packing Co. as operator of the plant at Port Benny. The principal herring operators in central Alaska were as follows:

| | |
|---|---|
| Saltery and reduction plants: | |
| Apex Fish Co | Port Wakefield. |
| Chatham Strait Fish Co | Crab Bay. |
| Oceanic Fisheries Co., Inc | Port Oceanic and Port Vita. |
| San Juan Fishing & Packing Co | Port San Juan. |
| Reduction plants: | |
| W. J. Imlach | Port Benny. |
| Perfection Fisheries, Inc | Thumb Bay. |
| Shepard Point Packing Co | Port Ashton. |
| Southwestern Herring, Inc | Iron Creek. |

Production of pickled herring was reported by four plants in western Alaska, one of which was engaged primarily in the cod fishery. The following were the principal operators in the western district:

| | |
|---|---|
| Alaska Commercial Co | Unalaska. |
| Golovin Bay Packing Co | Golovin. |
| Hovland & Nesskaug | Dutch Harbor. |

Studies of the life history and fluctuations in the abundance of the herring populations in Alaska were continued by Edwin H. Dahlgren and two assistants, the work being carried on in southeast Alaska and in the Prince William Sound and Kodiak areas of central Alaska.

### STATISTICAL SUMMARY

There were 940 persons engaged in the herring industry in 1938, as compared with 988 in 1937. The number of plants decreased from 20 to 17. Products of the fishery were valued at $2,053,084, a decrease of $838,770, or 29 percent from 1937, when the total value was $2,891,854. Scotch-cured herring increased from 2,098,040 pounds, valued at $107,968, to 2,186,150 pounds, valued at $130,424, or about 4 percent in quantity and about 21 percent in value. Herring for bait increased from 5,238,172 pounds, valued at $48,816, to 6,143,768 pounds, valued at $61,802, or 17 percent in quantity and about 27 percent in value. Meal decreased 14 percent in quantity and about 13 percent in value, and oil decreased about 19 percent in quantity and 39 percent in value.

*Persons engaged, wages paid, and operating units, Alaska herring industry, 1938*

| Item | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| PERSONS ENGAGED | | | | |
| Fishermen: | | | | |
| Whites | 247 | 284 | 3 | 534 |
| Natives | 13 | | 3 | 16 |
| Total | 260 | 284 | 6 | 550 |
| Shoresmen: | | | | |
| Whites | 99 | 253 | 10 | 362 |
| Natives | | 7 | 21 | 28 |
| Total | 99 | 260 | 31 | 390 |
| Grand total | 359 | 544 | 37 | 940 |
| Wages paid shoresmen | $71,877 | $164,607 | $6,195 | $242,679 |
| OPERATING UNITS | | | | |
| Plants, shore | 5 | 9 | 3 | 17 |
| Vessels: | | | | |
| Power, over 5 tons | 37 | 36 | | 73 |
| Net tonnage | 1,242 | 1,636 | | 2,878 |
| Launches | 2 | 2 | 1 | 5 |
| Gill net boats | | | 4 | 4 |
| Power dory | | | 1 | 1 |
| Seine skiffs | 32 | 35 | | 67 |
| Other rowboats and skiffs | 9 | 4 | | 13 |
| Apparatus: | | | | |
| Purse seines | 37 | 36 | 3 | 76 |
| Fathoms | 6,157 | 6,240 | 300 | 12,697 |
| Gill nets | | | 6 | 6 |
| Fathoms | | | 510 | 510 |
| Pound seines | 6 | | | 6 |
| Pounds | 9 | | | 9 |

*Products of Alaska herring industry in 1938*

| Item | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Fresh, for bait | 2,826,404 | $37,865 | 1,250 | $13 | -------- | -------- | 2,827,654 | $37,878 |
| Frozen, for bait | 3,316,114 | 23,924 | -------- | -------- | -------- | -------- | 3,316,114 | 23,924 |
| Pickled, for food: | | | | | | | | |
| Scotch cure | -------- | -------- | 1,634,000 | 97,927 | 552,150 | $32,497 | 2,186,150 | 130,424 |
| Norwegian cure | -------- | -------- | -------- | -------- | 192,800 | 5,784 | 192,800 | 5,784 |
| Roused for food (bloater stock) | -------- | -------- | 261,350 | 6,395 | 155,550 | 6,360 | 416,900 | 12,755 |
| Meal | 7,279,394 | 132,032 | 24,911,116 | 417,582 | -------- | -------- | 32,190,510 | 549,614 |
| Oil | [1] 6,756,908 | 267,021 | [2] 27,166,440 | 1,025,684 | -------- | -------- | [3] 33,923,348 | 1,292,705 |
| Total | 20,178,820 | 460,842 | 53,974,156 | 1,547,601 | 900,500 | 44,641 | 75,053,476 | 2,053,084 |

[1] 900,921 gallons. [2] 3,622,192 gallons. [3] 4,523,113 gallons.

## HALIBUT

The voluntary control of production by the halibut fleet was continued in 1938, with some modifications from the previous program, in an effort to make it more effective in spreading the season's landings and maintaining favorable prices. This system was not entirely successful, and a concentration of landings in the spring was reflected in low price levels.

Regulations of the International Fisheries Commission increased the quotas for areas 2 and 3 by 1,000,000 pounds each. Fishing was discontinued more promptly than in the previous year, however, after the quota was reached. The season opened on April 1, and in areas 1 and 2 it closed at midnight July 29. The final date of clearance for halibut fishing in area 3 was September 29, and fishing in this area and in area 4 closed on October 29.

In addition to the sale of halibut and other fish livers for pharmaceutical purposes, the fishermen in 1938 had a market for halibut and sablefish viscera at 10 cents per pound, this material being used in experiments to determine the feasibility of extracting oils of a high vitamin content. It is understood that the yield of medicinal oil therefrom did not justify the expenditures, however, and that no further contract would be entered into for the purchase of viscera in 1939.

Biological studies of the Pacific halibut were continued by the International Fisheries Commission under the direction of Dr. W. F. Thompson. The schooner *Eagle* was chartered for research work in the Gulf of Alaska in the 1937–38 season.

### STATISTICAL SUMMARY

Seven hundred and twenty-five persons were employed in the Alaska halibut fishery in 1938—an increase of 28 over the number reported for the preceding year; and products, exclusive of livers and viscera, amounted to 13,556,355 pounds, valued at $890,301. This production represents the total fares of the Alaska halibut fleet, which comprises all American vessels landing more than one-half of their catch in Alaska or British Columbia ports rather than in the States. Landings of halibut, exclusive of livers and viscera, in Alaska totaled 8,296,907 pounds, valued at $499,472, which include 26,000 pounds valued at $2,000 landed by Canadian vessels. In 1937 the landings of the Alaska fleet were 13,281,681 pounds, valued at $931,629, and landings in Alaska amounted to 8,705,204 pounds, valued at $557,911. Fares of the Alaska fleet in 1938, therefore, increased 2 percent in quantity but decreased 4 percent in value from 1937. The landings in Alaska ports in 1938 decreased about 5 percent in quantity and 10 percent in value from the preceding year.

The amount of halibut livers landed by the Alaska fleet was not reported, but it was stated that there were altogether about 866,000 pounds of halibut, sablefish, "lingcod," and rockfish livers, valued at about $405,000, landed at Alaska and Pacific coast ports during 1938 by American vessels, as compared with 953,000 pounds, valued at $449,000, landed by American vessels in 1937. The estimated amount of halibut livers landed in Alaska was 133,000 pounds, valued at $66,500.

Halibut and sablefish viscera landed by the American fleet amounted to about 983,000 pounds, valued at $98,000. The estimated amount landed in Alaska was 240,787 pounds, valued at $24,079. No segregation was made according to species, but as the bulk of the product was halibut viscera, the entire amount is being included in the halibut statistics.

These statistics were compiled from data collected by the International Fisheries Commission and by agents of the Bureau.

*Persons engaged, wages paid, and operating units, Alaska halibut industry, 1938*

| Item | Total | Item | Total |
|---|---|---|---|
| PERSONS ENGAGED | | OPERATING UNITS | |
| | | Vessels: | |
| Fishermen, whites | 577 | Power, over 5 tons | 110 |
| | | Net tonnage | 1,570 |
| Shoresmen: | | Launches | 28 |
| Whites | 137 | Skates of lines | 3,422 |
| Natives | 11 | | |
| Total | 148 | | |
| Grand total | 725 | | |
| Wages paid shoresmen | $22,046 | | |

*Products of the Alaska halibut fishery in 1938*

| Products | Pounds | Value |
|---|---|---|
| Fresh (including local) | 6,794,439 | $429,448 |
| Frozen | 6,761,916 | 460,853 |
| Livers [1] | 133,000 | 66,500 |
| Viscera [2] | 240,787 | 24,079 |
| Total | 13,930,142 | 980,880 |

[1] The amount of livers landed by the Alaska fleet was not segregated; the quantity shown herein is the estimated amount landed in Alaska.

[2] The total includes some sablefish viscera, the amount and value of which it was impossible to segregate.

## COD

Operations in the cod industry were on about the same scale as in other recent years in the Shumagin Islands region and in the vicinity of Unalaska. Twenty-six whites and two natives were reported engaged in the fishery from shore stations, including men aboard the motor vessels *Gloria West* (59 tons) and *Sitka* (50 tons), each of which made an expedition to the westward, the latter for the purpose of experimenting with an otter trawl for the taking of cod. Products amounted to 281,138 pounds of dry-salted cod, valued at $15,218; 6,678 pounds of stockfish, valued at $878; and 725 pounds of tongues, valued at $85—a total of 288,541 pounds, valued at $16,181, as compared with 203,327 pounds, valued at $10,338, in 1937.

Three sailing vessels comprised the Bering Sea fleet, the products of which are not included with the Alaska fisheries output because the vessels operate from and land their fares in ports of the Pacific Coast States. Of these vessels, the *Wawona* (413 tons) was operated by the Robinson Fisheries Co., and the *Sophie Christenson* (570 tons) and *Charles R. Wilson* (328 tons) were operated by the Pacific Coast Codfish Co. The Union Fish Co. did not send any boats north this year.

Products of the offshore fishery were 3,065,450 pounds of dry-salted cod, valued at $129,572, and 14,325 pounds of tongues, valued at $1,340—a total of 3,079,775 pounds, valued at $130,912, as compared with 3,795,923 pounds, valued at $188,611 in 1937. The offshore fishery employed 104 persons, or 61 less than in the previous year.

## WHALES

The American Pacific Whaling Co. operated only its Akutan station in Alaska during 1938, its other station at Port Hobron, Kodiak Island, standing idle. Of the 136 persons employed during the season, 125 were whites and 11 natives.

There were 5 steam whalers operated, or 1 less than the combined number for the two plants in the preceding year, and 173 whales were taken, consisting of 65 finback, 12 humpback, 33 sulphur bottom, and 63 sperm whales.

Operations in this industry continued to be controlled by the International Whaling Act and regulations issued thereunder. The regulations of October 9, 1936, were superseded by revised joint regulations of the Secretary of the Treasury and the Secretary of Commerce approved by the President on May 18, 1938. These regulations were again modified in December 1938, giving effect to a supplementary agreement drafted on June 8, 1937, at the International Whaling Conference in London. An important provision of the new agreement was the raising of the minimum-length limit of certain species that may be lawfully taken.

An officer of the Coast Guard was assigned to duty at the Akutan station during the season to enforce the provisions of the Whaling Treaty Act and the regulations. Statistical and biological data were collected by the Bureau and forwarded through the State Department to the International Bureau for Whaling Statistics, Oslo, Norway.

Whale products in 1938 amounted to 304,800 gallons of body oil, valued at $103,657; 181,900 gallons of sperm oil, valued at $54,570; 396 tons of meal from meat, valued at $15,796; and 216 tons of bone meal, valued at $5,618—a total value of $179,641, as compared with $479,121 in 1937.

## CLAMS

The canning of clams in Alaska in 1938 was centered, as before, in Cordova and vicinity. Notwithstanding the fact that the clam fishery regulations had been modified to permit the taking of an additional 160,000 pounds of razor clams, or a total of 1,200,000 pounds including shells, in the Prince William Sound, Copper River, and Bering River areas during the first 6 months of the year, this limit was reached earlier than in 1937 and the spring season closed on April 23. No change was made in the fall quota of 280,000 pounds, but only limited operations were conducted after activities were resumed on August 16, and the quota was not reached. The total output from this district, therefore, was somewhat less than that of the previous year.

An analysis of the catch in the above-mentioned district indicated that at least 98 percent of the clams were mature, the majority running from 7–9 years of age, with 8-year-olds predominating. The Bureau's conservation policy has played an important part in restoring the clam beds to a good condition, and it now appears that the area can provide a larger annual pack if digging is extended to outlying grounds. Modified regulations for the ensuing year, therefore, will place a limitation on the output of certain well-known beds and will increase the limitation on the pack for the district as a whole.

Eleven operators, as follows, engaged in the canning of clams in Cordova and vicinity, this activity in some cases being incidental to the canning of salmon or of crab meat: Arctic Sanitary Packing Co. Blue Sea Packing Co., Buck Canning Co., W. R. Gilbert Co., Inc., Gulf Packing Co., E. A. Haltness, Hawkins Island Packing Co., Pioneer Canneries, Inc., Scotty's Packing Co., Sheep Bay Packing Co., and S. E. Smith Packing Co. Other operators in central Alaska were the Enterprise Sea Food Co., at Ninilchik, and the Sandvik Hand Cannery, at Uganik. The Sheep Bay Packing Co. and the Sandvik Hand Cannery packed butter clams; all other production reported for central Alaska consisted of razor clams

In southeast Alaska the plant of the Nickey Packing Co., in Tongass Narrows, prepared a limited pack of butter clams, and the Pacific American Fisheries, Inc., diverted its salmon cannery at Kasaan to clam-packing operations, the raw product for this purpose being imported from the razor clam beds at Massett, B. C.

A small production of razor clams was prepared also at Izembeck Bay, on the north shore of the Alaska Peninsula, by the Pacific Fisheries & Trading Co., in conjunction with its crab-canning activities.

There were 584 persons employed, of whom 477 were whites, 95 natives, 11 Filipinos, and 1 Japanese. The total production amounted to 40,870 cases containing 1,029,588 pounds (1,015,332 pounds of razor clams and 14,256 pounds of butter clams), valued at $252,774. This is an increase of 26 percent in quantity and 5 percent in value over the output for 1937, when clam products amounted to 816,942 pounds valued at $240,392.

*Products of Alaska clam industry in 1938*

| Item | Cases | Pounds | Value |
|---|---|---|---|
| RAZOR CLAMS | | | |
| Minced: | | | |
| ½-pound cans (48 to case) | [1] 34,592 | 830,208 | $204,830 |
| 10-ounce cans (48 to case) | 4,457 | 133,710 | 32,491 |
| 1-pound cans (48 to case) | 119 | 5,712 | 1,189 |
| Whole: | | | |
| 10-ounce cans (48 to case) | 1,126 | 33,780 | 9,765 |
| 1-pound cans (48 to case) | 234 | 11,232 | 2,556 |
| 20-ounce cans (24 to case) | 23 | 690 | 161 |
| Total, razor clams | 40,551 | 1,015,332 | 250,992 |
| BUTTER CLAMS | | | |
| Minced. | | | |
| ½-pound cans (48 to case) | 12 | 288 | 72 |
| Whole: | | | |
| ½-pound cans (48 to case) | 32 | 768 | 110 |
| 1-pound cans (48 to case) | 250 | 12,000 | 1,500 |
| Juice: | | | |
| 1-pound cans (48 to case) | 25 | 1,200 | 100 |
| Total, butter clams | 319 | 14,256 | 1,782 |
| Grand total | 40,870 | 1,029,588 | 252,774 |

[1] Of this number, 9,615 cases, valued at $57,690, were packed from clams obtained from Massett, B. C.

## SHRIMP

Two plants in southeast Alaska were engaged primarily in the shrimp business: Alaskan Glacier Sea Food Co., at Petersburg, and Reliance Shrimp Co., at Wrangell. Cold-packed shrimp were also produced at the crab cannery of Dean C. Kayler, at Petersburg. which cannery was erected during the winter to replace that of Kayler-Otness, Inc., destroyed by fire in November 1937. A small production of shrimp was reported also by the Alaskan Glacier Sea Food Co., at Cordova, in conjunction with its crab-canning operations.

There were 141 persons engaged in the industry, of whom 27 were whites, 84 natives, 16 Japanese, 9 Filipinos, and 5 Mexicans. Products consisted of 431,900 pounds of cold-packed shrimp meat, valued at $167,086; 3,211 pounds of frozen shrimp meat, valued at $1,284; and 690 pounds of fresh shrimp in shell, valued at $104—a total of 435,801 pounds, valued at $168,474. Comparable figures for 1937 show a production of 463,385 pounds, valued at $164,933.

## CRABS

During the year 1938, four plants in southeast Alaska and seven in the central district were engaged in the crab fishery. The A R B Packing Co. continued to operate as a separate unit its crab plant at Wrangell, which had formerly belonged to the Boardway Canning Co. Other plants in southeast Alaska were those of Dean C. Kayler, at Petersburg, and the Salt Sea Fisheries, at Tenakee, each of which was built to replace one destroyed by fire in the fall of 1937, and the plant of Oscar H. Wood, at Hoonah.

In addition to the operations carried on at its Cordova plant, the Alaskan Glacier Sea Food Co. packed crab meat at a newly equipped branch plant on Bering River. Engaged in the crab industry in the Cordova region also were the Gulf Packing Co., which packed both clams and salmon; the S. E. Smith Packing Co., primarily a clam cannery; and the Sheep Bay Packing Co.

The canning of king crabs was again carried on by the King Crab Co., at Seldovia. A limited pack of this species was prepared also by the Pacific Fisheries & Trading Co. aboard its floating plant *Tondeleyo*, which prospected for crabs in the Kodiak area and to the westward along the Alaska Peninsula.

The bulk of the season's output was canned, less than 10 percent of the total volume of crab products being made up of cold-packed meat and whole crabs in the shell.

There were 420 persons engaged in the industry, of whom 332 were whites, 61 natives, 26 Filipinos, and 1 Mexican. Products consisted of 448,761 pounds of canned crab meat (3,866 cases of 6½-ounce cans, 12,092 cases of ½-pound cans, 296 cases of 13-ounce cans, and 749 cases of 1-pound cans, 48 to the case; 224 cases of 1-pound cans, 90 to the case; and 517 cases of 20-ounce cans, 24 to the case), valued at $169,480; 2,765 pounds of cold-packed meat, valued at $1,134; 225 pounds of crab meat in bulk, sold locally, valued at $90; and 1,029 dozen whole crabs in the shell, valued at $1,934. Except for 24,312 pounds of king crab (1,013 cases of ½-pound cans), valued at $9,747, the entire production was of Dungeness crab. The total output of crab products in 1938 was 483,276 pounds, valued at $172,638, as compared with 711,318 pounds valued at $276,099 in 1937, a decrease of 32 percent in quantity and 37 percent in value.

*Products of the Alaska crab industry in 1938*

| Product | Southeast Alaska | | | Central Alaska | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | Number | Pounds | Value | Number | Pounds | Value | Number | Pounds | Value |
| DUNGENESS CRABS | | | | | | | | | |
| Canned: | | | | | | | | | |
| 6½-ounce cans (48 to case)..cases | | | | 3,866 | 75,387 | $34,794 | 3,866 | 75,387 | $34,794 |
| ½-pound cans (48 to case)..cases | 5,313 | 127,512 | $47,817 | 5,766 | 138,384 | 47,314 | 11,079 | 265,896 | 95,131 |
| 13-ounce cans (48 to case)..cases | | | | 296 | 11,544 | 5,337 | 296 | 11,544 | 5,337 |
| 1-pound cans (48 to case)..cases | | | | 749 | 35,952 | 12,030 | 749 | 35,952 | 12,030 |
| 1-pound cans (90 to case)..cases | | | | 224 | 20,160 | 8,047 | 224 | 20,160 | 8,047 |
| 20-ounce cans (24 to case)..cases | | | | 517 | 15,510 | 4,394 | 517 | 15,510 | 4,394 |
| Cold-packed meat: 5-pound cans | 553 | 2,765 | 1,134 | | | | 553 | 2,765 | 1,134 |
| Crab meat in bulk..pounds | | | | 225 | 225 | 90 | 225 | 225 | 90 |
| Whole in shell..dozen | 572 | 15,865 | 990 | 457 | 15,660 | 944 | 1,029 | 31,525 | 1,934 |
| Total, Dungeness crabs | | 146,142 | 49,941 | | 312,822 | 112,950 | | 458,964 | 162,891 |
| KING CRABS | | | | | | | | | |
| Canned: ½-pound cans (48 to case) cases | 60 | 1,440 | 450 | 953 | 22,872 | 9,297 | 1,013 | 24,312 | 9,747 |
| Grand total | | 147,582 | 50,391 | | 335,694 | 122,247 | | 483,276 | 172,638 |

## TROUT

The commercial production of Dolly Varden and steelhead trout in the Territory is small and, for the most part, incidental to other branches of the fisheries in southeast Alaska. During the 1938 season, however, 2 white fishermen in the central district were engaged in the industry. The total products were as follows: Dolly Vardens, 52,128 pounds fresh, valued at $4,712, and 20,395 pounds frozen, valued at $1,926; steelheads, 334 pounds fresh, valued at $17, and 5,875 pounds frozen, valued at $236.

### MISCELLANEOUS FISHERY PRODUCTS

Fish of minor commercial importance are taken in limited quantities, chiefly in connection with the halibut fishery, and are landed in ports of Alaska and British Columbia and at Seattle. Such products landed in Alaska in 1938 were as follows: Sablefish, 776,825 pounds frozen, valued at $23,499; 100,364 pounds pickled, valued at $4,167, and 32,045 pounds of livers, valued at $11,216; rockfish, 4,376 pounds frozen, valued at $90, flounders, 150,000 pounds fresh, valued at $3,750, and 82,145 pounds frozen, valued at $3,300; "lingcod", 610 pounds fresh, valued at $10; and "lingcod" and rockfish livers, 1,544 pounds, valued at $618.

## FUR-SEAL INDUSTRY

### PRIBILOF ISLANDS

#### GENERAL ADMINISTRATIVE WORK

In 1938, 58,364 fur-seal skins were taken at the Pribilof Islands, an increase of 3,184 over the numbers taken in the preceding year. Of the skins obtained on St. Paul Island, 43,867 were removed from the animals by the stripping process and blubbered before curing. The remaining 2,215 skins from that island and the entire take of 12,282 skins from St. George Island were removed by the skinning process.

Delivery was made at Seattle to a representative of the Canadian Government of 8,755 sealskins, representing 15 percent of the season's take selected proportionately from the different sizes and grades, in accordance with provisions of the treaty of July 7, 1911. The remaining 49,609 skins were forwarded to the Fouke Fur Co. at St. Louis, Mo., for processing and sale at public auction. From the proceeds of sale of these skins, payment will be made to Japan of its share of 15 percent of the season's take, due under the fur-seal treaty.

The byproducts plant at St. Paul Island produced 30,587 gallons of oil and 178½ tons of meal from fur-seal carcasses and blubber. Except for small quantities retained at the Pribilof Islands for use as fox feed, these products were shipped to Seattle, where the oil was sold by competitive bidding and the meal was transferred to the Division of Fish Culture for feeding fish in hatcheries throughout the country.

In the 1938–39 season there were taken on the Pribilof Islands 1,029 fox pelts, consisting of 219 blue and 5 white pelts from St. Paul Island and 799 blue and 6 white pelts from St. George Island.

Sealing and foxing operations were carried on by Pribilof natives under the direction of the Bureau's staff. Approximately 80 additional natives from the mainland and Aleutian Islands were employed to assist with fur-seal activities during the summer.

On St. George Island three new cottages and a warehouse were built and concrete foundations were laid for a bunkhouse and for a small shed. Construction of a new machine shop was started on St. Paul Island. Sections of road on both islands were repaired or resurfaced, and improved roads were extended on St. George Island. Additional buildings, including a powerhouse and four overnight

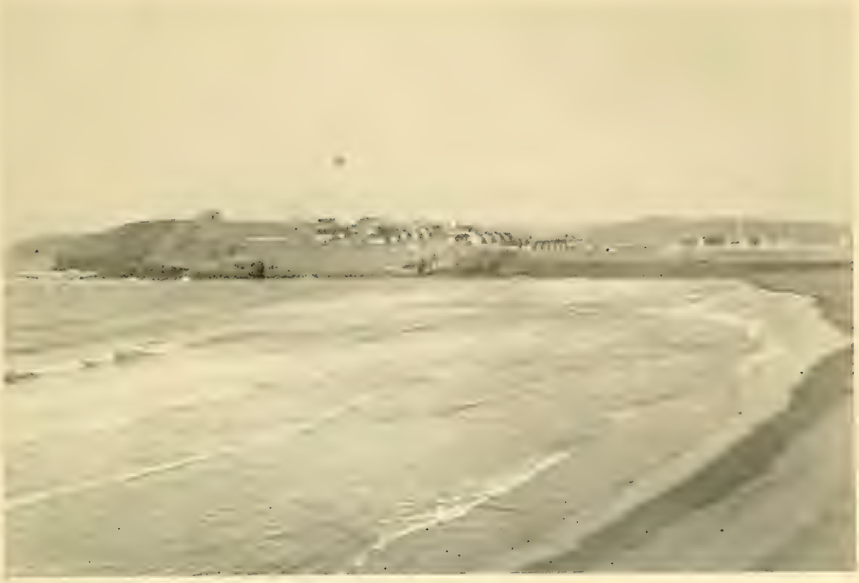

FIGURE 3.—St. Paul Village, St. Paul Island, Alaska.

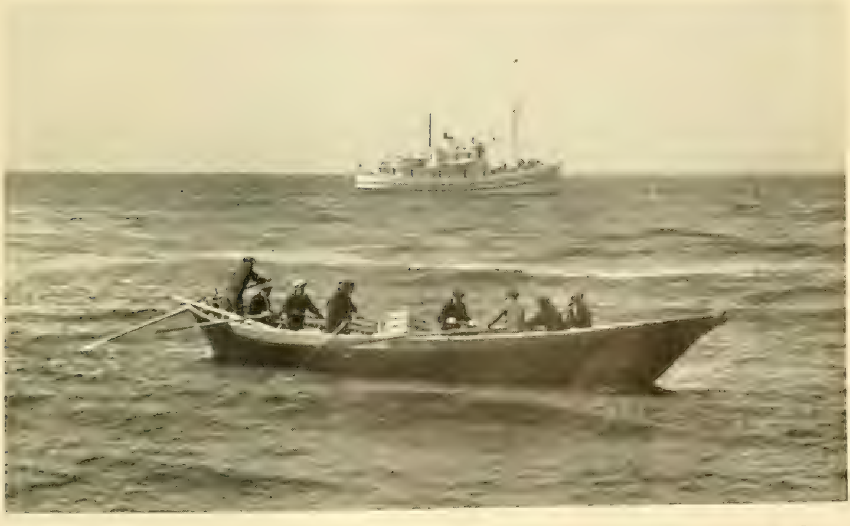

FIGURE 4.—Bidarrah unloading supplies from the Bureau of Fisheries vessel *Penguin* at St. George Island, Alaska.

cabins, were erected at the substation for sea-otter patrol in the western Aleutians.

During the northward migration of the fur seals and while the animals remained in Bering Sea waters, a patrol was maintained by Coast Guard vessels, which also rendered other assistance in the Bureau's work. The Navy Department detailed the U. S. S. *Vega* to carry the annual shipment of supplies from Seattle to the Pribilof Islands and to bring out the season's take of sealskins.

### TRANSPORTATION OF SUPPLIES

The U. S. S. *Vega*, of the Navy, sailed from Seattle on July 29 with the annual shipment of supplies for the Pribilof Islands, which aggregated 1,290 tons of general freight, 252,181 board feet of lumber and 540 bundles of shingles for St. Paul Island and 784 tons of freight, 115,427 board feet of lumber and 500 bundles of shingles for St. George Island, a total of 2,074 tons of freight, 367,608 board feet of lumber, and 1,040 bundles of shingles. The vessel arrived at the Islands on August 6.

On the return trip to Seattle, covering the period from August 17 to August 25, the vessel brought out 58,364 sealskins, 168 tons of seal meal, 40 barrels of blubber, 217 empty steel drums, and miscellaneous freight.

Additional supplies for the Pribilof Islands were shipped during the year on the *Penguin*.

### POWER VESSEL "PENGUIN"

Five round trips between Seattle and the Pribilof Islands were made by the *Penguin* in 1938, carrying passengers and supplies. In addition, the vessel performed interisland service and made trips to settlements along the Alaska Peninsula and the Aleutian Islands to transport native laborers hired for fur-seal work at the Pribilofs during the summer. Two trips were made to the western Aleutians—one in July and one in September—in connection with the sea-otter patrol. The July trip covered a period of approximately 3 weeks, during part of which time the ship's crew assisted with the construction of a powerhouse and the installation of a power plant and other equipment at the station on Amchitka Island. On the September trip to the westward, freight for the Navy Aerological Station at Kanaga was delivered en route.

A full cargo of freight, chiefly perishable foodstuffs, was carried on each trip from Seattle, and outgoing shipments from the islands included the 1937–38 take of foxskins, transported to Seattle in March, and the fur-seal oil produced at the byproducts plant on St. Paul Island, which was brought out in September and November.

The northbound voyages of the *Penguin* were as follows: Feb. 19–Mar. 11; May 2–14; June 11–24; Aug. 23–Sept. 5; and Oct. 15–30. Southbound voyages covered the following periods: Mar. 16–29; May 22–June 1; Aug. 3–14; Sept. 23–Oct. 5; and Nov. 2–14. On these voyages transportation was furnished to 76 passengers for the Bureau, including 23 employees of the Fouke Fur Co. who assisted with the season's sealing activities at the islands, and 3 persons connected with the Bureau's salmon patrol and investigations in Alaska. The vessel also transported 21 passengers for the Navy, 5 for the Office of Indian Affairs, 2 for the Coast Guard, 1 for the Bureau of Lighthouses, and 20 unofficial travelers.

The *Penguin* cruised 29,608 nautical miles during the year.

## ROADS

*St. Paul Island.*—No new road work was undertaken on St. Paul Island during the year. About 1½ miles of the Northeast Point plank road around Big Lake was torn up and replaced with a fill of scoria. The Zapadni road was widened for a distance of approximately 800 feet. All other roads were dragged, and where necessary, resurfaced.

*St. George Island.*—The Staraya Artil road was extended approximately 2,000 feet, to the lake at the foot of the rookery. The Zapadni road was extended about 3,500 feet to a suitable killing ground near the rookery. About 4,000 feet of the Zapadni plank road was torn up and replaced with scoria.

## BUILDINGS

*St. Paul Island.*—Construction of a new machine shop was started on St. Paul Island. When fully completed, this building will house all machinery and tools required in a first-class repair shop. There will also be a room for painting, another for overhauling cars, and another for stores. No other major construction work was undertaken on this island.

*St. George Island.*—Three additional 3-room frame cottages for natives were constructed this season. A warehouse, 20 by 50 feet, was built at Zapadni. This will permit unloading the *Penguin* during the fall and winter months, when prevailing winds often make the village landing unfavorable for long periods. Concrete foundations were poured for a new bunkhouse for Aleutian workmen and for a small shed to house the hoist used for unloading cargo at the village dock. Considerable repair work on native houses, including reshingling, was undertaken throughout the year.

## BYPRODUCTS PLANT

The byproducts plant on St. Paul Island was in operation from June 20 to August 3, rendering oil and meal from 31,805 seal carcasses and 7,085 cubic feet, or about 368,420 pounds, of blubbler. Total production for the season amounted to 471 barrels, or 24,252 gallons, of No. 1 oil; 115½ barrels, or 6,335 gallons, of No. 2 oil; and 357,222 pounds of meal. The foregoing quantities in gallons represent averages of 51.49 gallons per barrel of No. 1 oil and 54.85 gallons per barrel of No. 2 oil, as determined from the products sold by weight upon the basis of 7½ pounds to the gallon.

In August the supply vessel *Vega* brought to Seattle 336,612 pounds of meal, which was turned over to the Division of Fish Culture for use in fish hatcheries throughout the country. The season's output of seal oil was shipped to Seattle on the *Penguin*—400 barrels on the September voyage, and the remaining 173 barrels in November. As in the past, small quantities of oil and meal were retained at the Pribilof Islands for use as fox feed.

In November, 23,944 gallons of No. 1 fur-seal oil and 5,869.33 gallons of No. 2 oil were sold at Seattle by competitive bidding for $4,149.19. The No. 1 oil brought 15 cents a gallon and the No. 2 oil 9½ cents a gallon, or decreases of 25 percent and 37 percent, respectively, from the prices obtained for similar grades of oil in 1937. One additional barrel of No. 1 oil, containing 51.49 gallons, was sold to a New York firm at the rate of 15 cents a gallon, for use in experimental processing of sealskins. The total gross receipts for fur-seal oil produced in 1938, therefore, were $4,156.91.

## NATIVES

### CENSUS

On December 31, 1938, the total native population of St. Paul Island was 265, including 12 persons who were temporarily absent from the island. There were seven births and one death during the year. Three natives left the island and settled in Unalaska and one native became a permanent resident on St. George Island.

The census on St. George Island on December 31, 1938, showed a population of 169 natives, including one who moved there from St. Paul Island. There were six births and one death during the year.

The total native population of both islands at the end of 1938 was 434; an increase of eight over the census of the previous year.

### MEDICAL SERVICE

The customary medical services and facilities were available to Government employees and the natives. One physician was stationed at St. Paul Island and another at St. George Island throughout the year. The general health of the natives was good, and sanitary conditions in the villages were satisfactory.

For the first time in several years a dentist was employed at the islands. He arrived at St. Paul Island on March 12, and during the remainder of the year a great deal of dental work was accomplished there and on St. George Island. Much remained to be done, however, as the teeth of the natives were in very poor condition, and the services of the dentist were continued for an indefinite period.

### SCHOOLS

Schools for the native children are maintained by the Bureau on St. Paul and St. George Islands, and all children between the ages of 6 and 16 years are required to attend. Two teachers are employed on each island. Instruction is confined to elementary branches, including some manual training and home economics.

The 1937–38 school year began on September 20, 1937, on St. Paul Island and closed on May 6, 1938. School opened on September 13, 1937, on St. George Island and closed on May 13, 1938.

On St. Paul Island there were 12 girls and 26 boys enrolled in the junior school, and 18 girls and 14 boys in the senior school, a total enrollment of 70. On St. George Island 11 girls and 8 boys were in the junior school and 11 girls and 9 boys in the senior school, a total of 39 pupils.

### SAVINGS ACCOUNTS

A number of the Pribilof Islands natives have savings accounts in the bank of the Washington Loan & Trust Co., Washington, D. C., on which they receive interest compounded semiannually at the rate of 2 percent. The Commissioner of Fisheries, as trustee, had custody during the year of these funds. There follows a summary of the trust account for the year 1938:

| | |
|---|---|
| On hand Jan. 1, 1938 | $4, 202. 04 |
| Interest earned from Jan. 1 to Dec. 31, 1938 | 79. 49 |
| Total | 4, 281. 53 |
| Withdrawn by natives | 430. 97 |
| On hand Dec. 31, 1938 | 3, 850. 56 |

The following is an itemized statement of the funds, setting forth the individual accounts:

*Funds of the Pribilof Islands natives in the custody of the United States Commissioner of Fisheries, as trustee, December 31, 1938*

| | |
|---|---|
| Kochutin, Alexandra | $1, 391. 09 |
| Kozloff, Marina | 139. 85 |
| Lekanof, Tatiana (Merculief) | 461. 45 |
| Lestenkof, Michael | 442. 86 |
| Merculief, Alexandra | 50. 05 |
| Merculief, Daniel | 434. 31 |
| Merculief, Elizabeth | $74. 84 |
| Merculief, Erena | 527. 51 |
| Merculief, George | 114. 07 |
| Pankoff, Agrippina | 214. 53 |
| Total | 3, 850. 56 |

### PAYMENTS FOR TAKING FUR-SEAL SKINS

Natives of the Pribilof Islands are paid for their work in taking sealskins at specified rates per skin. The sealers on each island are divided into classes according to their skill and ability, and the collective earnings are apportioned among them, each worker in a given class receiving an equal share. Small bonuses are paid for special services.

On St. Paul Island the payments to natives in 1938 were at the rate of 60 cents per skin for the 46,082 sealskins taken, or a total of $27,649.20, and in addition $180 was paid to 2 foremen and 4 mess attendants.

Natives on St. George Island were paid at the rate of 75 cents per skin, the total in 1938 amounting to $9,211.50 for the 12,282 sealskins taken, and an additional $100 was paid to two native foremen.

Details of these payments are shown in the following table:

*Payments to Pribilof Islands natives for taking fur-seal skins, calendar year 1938*

| Classification | St. Paul Island | | | St. George Island | | |
|---|---|---|---|---|---|---|
| | Number of men | Share of each | Total | Number of men | Share of each | Total |
| First class | 35 | $500. 40 | $17, 514. 00 | 33 | $213. 75 | $7, 053. 75 |
| Second class | 11 | 400. 80 | 4, 408. 80 | 8 | 155. 25 | 1, 242. 00 |
| Third class | 11 | 270. 00 | 2, 970. 00 | 5 | 105. 75 | 528. 75 |
| Fourth class | 11 | 207. 60 | 2, 283. 60 | 3 | 80. 25 | 240. 75 |
| Fifth class | 5 | 74. 40 | 372. 00 | 2 | 57. 00 | 114. 00 |
| Boys' class | 3 | 33. 60 | 100. 80 | 1 | 32. 25 | 32. 25 |
| Foreman (additional compensation) | | | 60. 00 | | | 55. 00 |
| Do | | | 40. 00 | | | 45. 00 |
| Mess attendants, 4 | | | 80. 00 | | | |
| Total | 76 | | 27, 829. 20 | 52 | | 9, 311. 50 |

### PAYMENTS FOR TAKING FOX SKINS

For taking fox skins on the Pribilof Islands in the 1937–38 season the natives were paid at the rate of $5 per skin. The payments amounted to $1,230 for the 246 fox skins taken on St. Paul Island and $3,085 for the 617 skins taken on St. George Island, a total of $4,315.

## FUR SEALS

### KILLINGS

In 1938, 58,364 fur seals were killed, of which 46,082 were taken on St. Paul Island and 12,282 on St. George Island. Details in regard to the killings are shown in the following tabulations:

*Seal killings on Pribilof Islands in 1938*

ST. PAUL ISLAND

| Date | Serial number of drive | Hauling ground | Skins secured |
|---|---|---|---|
| June 6 | 1 | Reef | 82 |
| 13 | 2 | do | 275 |
| 19 | 3 | Zapadni | 127 |
| 20 | 4 | Reef and Gorbatch | 631 |
| 21 | 5 | Polovina and Half Way | 109 |
| 22 | 6 | Vostochni and Morjovi | 521 |
| 23 | 7 | Zapadni | 104 |
| 24 | 8 | Tolstoi, Lukanin, and Kitovi | 349 |
| 25 | 9 | Reef and Gorbatch | 897 |
| 26 | 10 | Polovina and Half Way | 78 |
| 27 | 11 | Vostochni and Morjovi | 949 |
| 28 | 12 | Zapadni | 642 |
| 29 | 13 | Tolstoi, Lukanin, and Kitovi | 324 |
| 30 | 14 | Reef and Gorbatch | 1,370 |
| July 1 | 15 | Polovina and Half Way | 284 |
| 2 | 16 | Vostochni and Morjovi | 1,510 |
| 3 | 17 | Zapadni | 762 |
| 4 | 18 | Tolstoi, Lukanin, and Kitovi | 905 |
| 5 | 19 | Reef and Gorbatch | 1,833 |
| 6 | 20 | Polovina and Half Way | 341 |
| 7 | 21 | Vostochni and Morjovi | 1,871 |
| 8 | 22 | Zapadni | 2,019 |
| 9 | 23 | Tolstoi, Lukanin, and Kitovi | 652 |
| 10 | 24 | Reef and Gorbatch | 1,923 |
| 11 | 25 | Polovina and Half Way | 971 |
| 12 | 26 | Vostochni and Morjovi | 2,533 |
| 13 | 27 | Zapadni | 2,213 |
| 14 | 28 | Tolstoi, Lukanin, and Kitovi | 566 |
| 15 | 29 | Reef and Gorbatch | 1,852 |
| 16 | 30 | Polovina and Half Way | 882 |
| 17 | 31 | Vostochni and Morjovi | 2,342 |
| 18 | 32 | Zapadni | 974 |
| 19 | 33 | Tolstoi, Lukanin, and Kitovi | 752 |
| 20 | 34 | Reef and Gorbatch | 2,242 |
| 21 | 35 | Polovina and Half Way | 722 |
| 22 | 36 | Vostochni and Morjovi | 2,030 |
| 23 | 37 | Zapadni | 1,203 |
| 24 | 38 | Tolstoi, Lukanin, and Kitovi | 799 |
| 25 | 39 | Reef and Gorbatch | 1,625 |
| 26 | 40 | Polovina and Half Way | 649 |
| 27 | 41 | Vostochni and Morjovi | 1,478 |
| 28 | 42 | Zapadni | 758 |
| 29 | 43 | Tolstoi, Lukanin, and Kitovi | 887 |
| 30 | 44 | Reef and Gorbatch | 821 |
| 31 | 45 | Polovina and Half Way | 396 |
| Aug. 1 | 46 | Vostochni and Morjovi | 829 |
| | | Total | 46,082 |

*Seal killings on Pribilof Islands in 1938*—Continued

ST. GEORGE ISLAND

| Date | Serial number of drive | Hauling ground | Skins secured |
|---|---|---|---|
| June 11 | 1 | North | 52 |
| 14 | 2 | Zapadni | 49 |
| 16 | 3 | North and East | 133 |
| 20 | 4 | Zapadni | 38 |
| 21 | 5 | North and Staraya Artil | 74 |
| 23 | 6 | East | 124 |
| 24 | 7 | Zapadni | 74 |
| 25 | 8 | North and Staraya Artil | 249 |
| 27 | 9 | East | 179 |
| 28 | 10 | Zapadni and South | 210 |
| 29 | 11 | North and Staraya Artil | 307 |
| July 1 | 12 | East | 246 |
| 2 | 13 | Zapadni | 278 |
| 3 | 14 | North and Staraya Artil | 479 |
| 5 | 15 | East | 410 |
| 6 | 16 | Zapadni | 137 |
| 7 | 17 | North and Staraya Artil | 476 |
| 9 | 18 | East | 458 |
| 10 | 19 | Zapadni | 148 |
| 11 | 20 | North and Staraya Artil | 908 |
| 13 | 21 | East | 688 |
| 14 | 22 | Zapadni | 235 |
| 15 | 23 | North and Staraya Artil | 805 |
| 17 | 24 | East | 620 |
| 18 | 25 | Zapadni | 378 |
| 19 | 26 | North and Staraya Artil | 783 |
| 21 | 27 | East | 544 |
| 22 | 28 | Zapadni | 171 |
| 23 | 29 | North and Staraya Artil | 669 |
| 25 | 30 | East | 567 |
| 26 | 31 | Zapadni | 101 |
| 27 | 32 | North and Staraya Artil | 521 |
| 28 | 33 | East | 320 |
| 29 | 34 | Zapadni | 44 |
| 30 | 35 | East and Staraya Artil | 807 |
|  |  | Total | 12, 282 |

## AGE CLASSES

The age class of a male seal of the Pribilof Islands herd is determined from the length of its body. The classification was derived from measurements of a large number of pups branded in 1912 and killed in subsequent years. The limits of the various age classes are shown in the table following:

*Age classes of male seals, Pribilof Islands*

| Age | Length | Age | Length |
|---|---|---|---|
|  | *Inches* |  | *Inches* |
| Yearlings | Up to 36.75 | 4-year-olds | 46 to 51.75 |
| 2-year-olds | 37 to 40.75 | 5-year-olds | 52 to 57.75 |
| 3-year-olds | 41 to 45.75 | 6-year-olds | 58 to 63.75 |

*Ages of seals killed on Pribilof Islands, calendar year 1938*

[On basis of classification shown in preceding table]

| Age | St. Paul Island | St. George Island | Total |
|---|---|---|---|
| Yearling males | 13 | | 13 |
| 2-year-old males | 1,431 | 225 | 1,656 |
| 3-year-old males | 42,864 | 11,276 | 54,140 |
| 4-year-old males | 1,642 | 712 | 2,354 |
| 5-year-old males | 2 | | 2 |
| Cows [1] | 130 | 69 | 199 |
| Total | 46,082 | 12,282 | 58,364 |

[1] Cows unavoidably and accidentally killed, or found dead.

Some of the seals recorded in the above tabulation as 2-year-olds and 4-year-olds probably were 3-year-olds, as not all male seals of a given age fall within the length limits assigned for the males of that age. As far as possible, the killings in 1938 were confined to 3-year-old males.

### COMPUTATION OF FUR-SEAL HERD

The computation of the fur-seal herd in 1938 was made by Supt. H. J. Christoffers. As of August 10 the total of all classes was 1,872,438—a numerical increase of 33,319 over the figures for the preceding year. The detailed report will be found on pages 161 to 168 of this document. The following is a comparative statement of the numerical strength of the various elements of the fur-seal herd in the years 1927 to 1938, inclusive.

*General comparison of computations of the seal herd on the Pribilof Islands, 1927 to 1938*

| Classes | 1927 | 1928 | 1929 | 1930 | 1931 | 1932 |
|---|---|---|---|---|---|---|
| Harem bulls | 4,643 | 6,050 | 7,187 | 8,312 | 9,233 | 10,088 |
| Breeding cows | 263,566 | 284,725 | 307,491 | 332,084 | 358,642 | 387,320 |
| Surplus bulls | 4,827 | 5,285 | 5,207 | 3,963 | 3,291 | 2,893 |
| Idle bulls | 972 | 1,449 | 1,633 | 1,899 | 1,888 | 2,349 |
| 6-year-old males | 13,450 | 12,857 | 10,399 | 5,612 | 6,553 | 8,154 |
| 5-year old males | 16,073 | 13,001 | 7,016 | 8,191 | 10,193 | 11,669 |
| 4-year-old males | 14,448 | 7,798 | 9,102 | 11,327 | 12,966 | 11,351 |
| 3-year-old males | 9,730 | 11,133 | 13,639 | 14,871 | 13,198 | 17,849 |
| 2-year-old males | 41,252 | 49,087 | 64,354 | 69,674 | 74,828 | 81,101 |
| Yearling males | 61,026 | 65,861 | 85,381 | 92,232 | 99,612 | 107,592 |
| 2-year-old cows | 48,186 | 57,061 | 67,210 | 72,605 | 78,410 | 84,682 |
| Yearling cows | 67,131 | 72,481 | 85,417 | 92,247 | 99,626 | 107,593 |
| Pups | 263,566 | 284,725 | 307,491 | 332,084 | 358,642 | 387,320 |
| Total | 808,870 | 871,513 | 971,527 | 1,045,101 | 1,127,082 | 1,219,961 |

| Classes | 1933 | 1934 | 1935 | 1936 | 1937 | 1938 |
|---|---|---|---|---|---|---|
| Harem bulls | 10,213 | 10,770 | 11,547 | 12,321 | 13,100 | 13,160 |
| Breeding cows | 418,299 | 451,751 | 487,883 | 526,848 | 568,982 | 614,499 |
| Surplus bulls | 4,700 | 6,494 | 6,139 | 7,994 | 9,140 | 7,277 |
| Idle bulls | 2,341 | 2,282 | 2,535 | 2,733 | 3,031 | 2,125 |
| 6-year-old males | 9,335 | 8,173 | 11,117 | 11,421 | 15,188 | 17,269 |
| 5-year-old males | 10,216 | 13,897 | 14,276 | 18,985 | 21,586 | 18,201 |
| 4-year-old males | 15,441 | 15,862 | 21,096 | 23,991 | 33,815 | 24,275 |
| 3-year-old males | 18,216 | 24,770 | 28,165 | 40,170 | 45,891 | 32,278 |
| 2-year-old males | 87,662 | 94,920 | 102,555 | 110,505 | 118,889 | 107,003 |
| Yearling males | 116,195 | 125,490 | 135,525 | 146,365 | 158,051 | 142,232 |
| 2-year-old cows | 91,454 | 98,768 | 106,666 | 115,197 | 124,410 | 123,150 |
| Yearling cows | 116,197 | 125,490 | 135,526 | 146,365 | 158,054 | 156,470 |
| Pups | 418,299 | 451,751 | 487,883 | 526,848 | 568,992 | 614,499 |
| Total | 1,318,568 | 1,430,418 | 1,550,913 | 1,689,743 | 1,839,119 | 1,872,438 |

### FOXES

Herds of blue foxes are maintained on St. Paul and St. George Islands which yield several hundred pelts annually. The foxes require very little care, roaming the islands at large and obtaining their food during most of the year from birds, birds' eggs, and marine life along the beaches. In the winter, when the natural supply of food is inadequate, the foxes are fed prepared rations, consisting chiefly of cereals, salted seal meat, and seal oil. During December and January the animals are trapped for their pelts or for marking and releasing as a breeding reserve.

#### TRAPPING SEASON OF 1938-39

In the 1938–39 season there were 1,029 fox pelts taken, of which 1,018 were blue and 11 white. Two hundred and nineteen blue and 5 white pelts were taken on St. Paul Island and 799 blue and 6 white pelts on St. George Island.

There were trapped, marked, and released for breeding stock, 53 male and 44 female foxes on St. Paul Island and 38 males and 49 females on St. George Island. The breeding reserve includes also a considerable number of animals that were not captured during the season.

### REINDEER

*St. Paul Island.*—The estimated number of reindeer in the herd on St. Paul Island on September 30, 1938, was 1,943, of which it was estimated that 430 were the young of the season. During the year 103 animals were killed for food. Of this number, 24 were used at the Bureau mess, 50 at the Aleutian mess, 25 by St. Paul Island natives, 6 were transferred to St. George Island, and 4 were not fit for food. The herd was apparently in good condition.

*St. George Island.*—A count of the reindeer in the herd on St. George Island on September 30, 1938, showed 38 animals, of which 8 were fawns. No reindeer on this island were killed for food during the year.

## FUR-SEAL SKINS

### SHIPMENTS

Seven hundred and seventy barrels containing 58,364 fur-seal skins taken on the Pribilof Islands in 1938 were shipped on the U. S. S. *Vega* and arrived at Seattle on August 25. Forty barrels of blubber, having a gross weight of 19,838 pounds, also were brought out on the *Vega* and delivered to the Fouke Fur Co., f. o. b. Seattle, for use in the tanning of sealskins.

Delivery of 8,755 sealskins, packed in 114 barrels, was made to a representative of the Canadian Government at Seattle on August 26, in accordance with provisions of the fur-seal treaty. The remaining 49,609 skins were forwarded by freight to the Fouke Fur Co. at St. Louis, Mo., and arrived there on September 3.

## SALES

Two public-auction sales of fur-seal skins taken on the Pribilof Islands were held in St. Louis in 1938—on May 2 and October 10, respectively—at which there were sold a total of 44,239 skins for a gross sum of $941,916. During the year, also, 992 sealskins taken on the Pribilof Islands were disposed of at private sales, under special authorization of the Secretary of Commerce, for a total of $22,241.68. In the following detailed statements the sales of other sealskins by the Department of Commerce for the account of the Government are included, in order that the records may be complete.

*May 2, 1938.*—On May 2, 1938, 19,949 Pribilof Islands fur-seal skins, dressed, dyed, and machined, were sold for $432,622.25. These skins consisted of 7,100 dyed black and 12,849 dyed safari brown.

*October 10, 1938.*—At the sale on October 10, 24,290 Pribilof Islands fur-seal skins were sold for $509,293.75. Of these, 24,244 dressed, dyed, and machined, brought $509,242.75, and 46 raw and partly processed skins brought $51. In addition, 3 confiscated fur-seal skins were sold raw for $1.50, making a total of $509,295.25 for fur-seal skins at this sale.

*Special sales.*—During the year, 992 Pribilof Islands fur-seal skins were sold under special authorization by the Department for advertising and promotional purposes, the gross sales amounting to $22,241.68. Of these skins, 563 dyed safari brown brought $11,617.88; 426 dyed black, $10,598.29; and 3 raw and partly processed skins, $25.51.

Further details in regard to the sales of sealskins by the Department of Commerce for the account of the Government in 1938 are given in the following tables:

*Comparative values by sizes and grades, with percentages of each size, of Pribilof sealskins sold at public auction in 1938*

| Classes and sales | Grade | Number | High | Low | Average | Total | Total number | Average price | Total amount | Percentage |
|---|---|---|---|---|---|---|---|---|---|---|
| DYED BLACK | | | | | | | | | | |
| Extra large: | | | | | | | | | | |
| May 2 | I and II | 160 | $32.25 | $30.50 | $31.26 | $5,001.25 | 346 | $26.51 | $9,173.25 | 4.87 |
| | Scarred, faulty, etc | 186 | 24.00 | 22.00 | 22.43 | 4,172.00 | | | | |
| Oct. 10 | I and II | 146 | 29.00 | 26.50 | 28.16 | 4,112.00 | 304 | 25.54 | 7,765.00 | 3.12 |
| | Scarred, faulty, etc | 158 | 23.50 | 21.00 | 23.12 | 3,653.00 | | | | |
| Large: | | | | | | | | | | |
| May 2 | I and II | 1,435 | 32.00 | 29.00 | 30.32 | 43,505.00 | 2,833 | 25.65 | 72,674.50 | 39.90 |
| | Scarred, faulty, etc | 1,398 | 23.50 | 19.00 | 20.87 | 29,169.50 | | | | |
| Oct. 10 | I and II | 1,812 | 26.75 | 24.50 | 25.51 | 46,227.25 | 3,394 | 23.79 | 80,737.75 | 34.80 |
| | Scarred, faulty, etc | 1,563 | 22.75 | 20.00 | 21.97 | 34,345.50 | | | | |
| | III | 19 | 9.00 | 8.00 | 8.68 | 165.00 | | | | |
| Medium: | | | | | | | | | | |
| May 2 | I and II | 1,840 | 24.00 | 20.00 | 22.41 | 41,240.00 | 3,683 | 20.24 | 74,555.50 | 51.88 |
| | Scarred, faulty, etc | 1,843 | 19.00 | 17.00 | 18.08 | 33,315.50 | | | | |
| Oct. 10 | I and II | 2,757 | 24.00 | 20.00 | 22.18 | 61,157.00 | 5,605 | 20.28 | 113,679.75 | 57.46 |
| | Scarred, faulty, etc | 2,780 | 20.25 | 17.00 | 18.69 | 51,944.75 | | | | |
| | III | 68 | 9.00 | 8.00 | 8.50 | 578.00 | | | | |
| Small medium: | | | | | | | | | | |
| May 2 | I and II | 135 | 18.00 | 17.50 | 17.74 | 2,395.00 | 238 | 16.47 | 3,920.50 | 3.35 |
| | Scarred, faulty, etc | 103 | 15.00 | 14.50 | 14.81 | 1,525.50 | | | | |
| Oct. 10 | I and II | 213 | 19.25 | 16.50 | 18.51 | 3,942.00 | 451 | 16.49 | 7,436.00 | 4.62 |
| | Scarred, faulty, etc | 227 | 15.50 | 14.00 | 14.99 | 3,403.00 | | | | |
| | III | 11 | 9.00 | 8.00 | 8.27 | 91.00 | | | | |
| All classes: | | | | | | | | | | |
| May 2 | | | | | | | 7,100 | 22.58 | 160,323.75 | 100.00 |
| Oct. 10 | | | | | | | 9,754 | 21.49 | 209,618.50 | 100.00 |
| DYED SAFARI BROWN | | | | | | | | | | |
| Extra extra large: | | | | | | | | | | |
| Oct. 10 | I and II | 6 | 28.50 | 28.50 | 28.50 | 171.00 | 12 | 25.50 | 306.00 | .08 |
| | Scarred, faulty, etc | 6 | 22.50 | 22.50 | 22.50 | 135.00 | | | | |
| Extra large: | | | | | | | | | | |
| May 2 | I and II | 280 | 29.50 | 27.50 | 28.36 | 7,940.00 | 640 | 24.36 | 15,590.00 | 4.98 |
| | Scarred, faulty, etc | 360 | 22.00 | 20.00 | 21.25 | 7,650.00 | | | | |
| Oct. 10 | I and II | 179 | 28.50 | 25.00 | 28.04 | 5,020.00 | 432 | 24.13 | 10,424.50 | 2.98 |
| | Scarred, faulty, etc | 250 | 23.25 | 20.00 | 21.54 | 5,385.00 | | | | |
| | III | 3 | 6.50 | 6.50 | 6.50 | 19.50 | | | | |
| Large: | | | | | | | | | | |
| May 2 | I and II | 2,485 | 30.00 | 24.00 | 27.40 | 68,101.25 | 4,795 | 23.93 | 114,721.25 | 37.32 |
| | Scarred, faulty, etc | 2,310 | 22.50 | 18.50 | 20.18 | 46,620.00 | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 10 | I and II | 2,534 | 28.50 | 24.00 | 25.57 | 64,790.00 | 5,051 | 22.83 | 115,300.00 | 34.86 |
| | Scarred, faulty, etc | 2,453 | 22.50 | 18.50 | 20.42 | 50,094.00 | | | | |
| | III | 64 | 6.50 | 6.50 | 6.50 | 416.00 | | | | |
| Medium: | | | | | | | | | | |
| May 2 | I and II | 3,440 | 23.50 | 20.00 | 21.51 | 73,980.00 | 6,560 | 19.51 | 128,000.00 | 51.05 |
| | Scarred, faulty, etc | 3,120 | 18.50 | 16.50 | 17.31 | 54,020.00 | | | | |
| Oct. 10 | I and II | 3,795 | 23.00 | 20.50 | 21.63 | 82,096.50 | 8,138 | 19.63 | 159,774.25 | 56.16 |
| | Scarred, faulty, etc | 4,245 | 19.50 | 16.75 | 18.15 | 77,060.25 | | | | |
| | III | 98 | 6.50 | 6.25 | 6.30 | 617.50 | | | | |
| Small medium: | | | | | | | | | | |
| May 2 | I and II | 359 | 19.25 | 17.00 | 17.65 | 6,337.25 | 854 | 16.38 | 13,987.25 | 6.6 |
| | Scarred, faulty, etc | 495 | 16.00 | 15.00 | 15.45 | 7,650.00 | | | | |
| Oct. 10 | I and II | 444 | 18.00 | 16.50 | 17.39 | 7,721.00 | 857 | 16.13 | 13,819.50 | 5.9 |
| | Scarred, faulty, etc | 391 | 15.50 | 15.00 | 15.25 | 5,961.00 | | | | |
| | III | 22 | 6.25 | 6.25 | 6.25 | 137.50 | | | | |
| All classes: | | | | | | | | | | |
| May 2 | | | | | | | 12,849 | 21.19 | 272,298.50 | 100.00 |
| Oct. 10 | | | | | | | 14,490 | 20.68 | 299,624.25 | 100.00 |
| MISCELLANEOUS | | | | | | | | | | |
| Oct. 10 | Unhaired and dressed | 28 | 1.50 | 1.50 | 1.50 | 42.00 | 46 | 1.11 | 51.00 | 100.00 |
| | Partly unhaired | 13 | .50 | .50 | .50 | 6.50 | | | | |
| | Raw | 5 | .50 | .50 | .50 | 2.50 | | | | |

*Special sales of Pribilof Islands fur-seal skins in 1938*

| Date | Number of skins | Description | Price per skin | Total |
|---|---|---|---|---|
| Jan. 31 | 70 | Dyed black, large | $31.42 | $2,199.40 |
| Feb. 28 | 2 | Raw salted | 6.66 | 13.32 |
| Mar. 31 | 80 | Dyed black, medium | 24.45 | 1,956.00 |
| | 80 | Dyed Safari brown, medium | 20.93 | 1,674.40 |
| May 16 | 80 | do | 21.51 | 1,720.80 |
| | 40 | Dyed black, medium | 22.41 | 896.40 |
| June 30 | 12 | Dyed Safari brown, large | 27.40 | 328.80 |
| | 22 | Dyed Safari brown, medium | 21.51 | 473.22 |
| | 40 | Dyed black, medium | 22.41 | 896.40 |
| | 23 | Dyed Safari brown, large | 27.40 | 630.20 |
| | 18 | Dyed Safari brown, medium | 21.51 | 387.18 |
| July 25 | 35 | Dyed black, large | 30.32 | 1,061.20 |
| July 26 | 1 | do | 21.69 | 21.69 |
| | 1 | Dyed Safari brown, large | 21.69 | 21.69 |
| | 1 | Partly processed | 12.19 | 12.19 |
| Aug. 30 | 80 | Dyed black, medium | 22.41 | 1,792.80 |
| Sept. 30 | 110 | Dyed Safari brown, medium, scarred and faulty | 17.31 | 1,904.10 |
| | 40 | Dyed Safari brown, medium | 21.51 | 860.40 |
| Oct. 30 | 80 | Dyed Safari brown, medium, scarred and faulty | 18.15 | 1,452.00 |
| | 40 | Dyed Safari brown, medium | 21.63 | 865.20 |
| Nov. 30 | 80 | Dyed black, medium | 22.18 | 1,774.40 |
| | 17 | Dyed Safari brown, large | 25.57 | 434.69 |
| | 20 | Dyed Safari brown, medium | 21.63 | 432.60 |
| Dec. 14 | 20 | do | 21.63 | 432.60 |
| | 992 | | | 22,241.68 |

## DISPOSITION OF FUR-SEAL SKINS TAKEN ON PRIBILOF ISLANDS

On January 1, 1938, there were on hand 68,498 fur-seal skins taken on the Pribilof Islands. Of these, 68,480 were at St. Louis, Mo., and 18 at Washington. In 1938, 58,364 fur-seal skins were taken on the Pribilof Islands, of which 8,755 were allotted to the Government of the Dominion of Canada as its share of the season's take and the remaining 49,609 were shipped to St. Louis. Of the skins on hand at the beginning of the year, 45,231 were disposed of, leaving 23,267 unsold, which, with the 49,609 from the 1938 take, make a total of 72,876 on hand on December 31, 1938. The following tables show further details in regard to fur-seal skins taken on the Pribilof Islands, as well as details in regard to other fur-seal skins under the control of the Department of Commerce:

*Summary of Government-owned fur-seal skins in the custody of Fouke Fur Co., at St. Louis, Mo., calendar year 1938*

| Source | On hand Jan. 1 | Receipts in 1938 | Sales in 1938 | On hand Dec. 31 |
|---|---|---|---|---|
| Taken on Pribilof Islands: | | | | |
| Calendar year 1935 | 3 | | 3 | |
| Calendar year 1936 | 21,574 | | 21,569 | 5 |
| Calendar year 1937 | 46,903 | | 23,659 | 23,244 |
| Calendar year 1938 | | 49,609 | | 49,609 |
| United States' share of Japanese fur-seal skins: Season of 1937 | | 210 | | 210 |
| Total | 68,480 | 49,819 | 45,231 | 73,068 |

*Summary of all Government-owned fur-seal skins under control of Department of Commerce, calendar year 1938*

| Source | On hand Jan. 1 | | | Receipts in 1938 | Disposed of in 1938 | | On hand Dec. 31 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Fouke Fur Co. | Washington office | Total | | Sales | Delivered to Canada | Fouke Fur Co. | Washington office | Total |
| Taken on Pribilof Islands: | | | | | | | | | |
| Calendar year 1918, held for reference purposes | -------- | 7 | 7 | -------- | -------- | -------- | -------- | 7 | 7 |
| Calendar year 1923 | -------- | 3 | 3 | -------- | -------- | -------- | -------- | 3 | 3 |
| Calendar year 1924 | -------- | 1 | 1 | -------- | -------- | -------- | -------- | 1 | 1 |
| Calendar year 1929 | -------- | 5 | 5 | -------- | -------- | -------- | -------- | 5 | 5 |
| Calendar year 1930 | -------- | 2 | 2 | -------- | -------- | -------- | -------- | 2 | 2 |
| Calendar year 1935 | 3 | -------- | 3 | -------- | 3 | -------- | -------- | -------- | -------- |
| Calendar year 1936 | 21,574 | -------- | 21,574 | -------- | 21,569 | -------- | 5 | -------- | 5 |
| Calendar year 1937 | 46,903 | -------- | 46,903 | -------- | 23,659 | -------- | 23,244 | -------- | 23,244 |
| Calendar year 1938 | -------- | -------- | -------- | 58,364 | -------- | 8,755 | 49,609 | -------- | 49,609 |
| Miscellaneous skins held for reference purposes | -------- | 4 | 4 | -------- | -------- | -------- | -------- | 4 | 4 |
| United States' share of Japanese sealskins: Season of 1937 | -------- | -------- | -------- | 210 | -------- | -------- | 210 | -------- | 210 |
| Total | 68,480 | 22 | 68,502 | 58,574 | 45,231 | 8,755 | 73,068 | 22 | 73,090 |

## SHIPMENT AND SALE OF FOX SKINS

The 231 blue and 15 white fox skins taken on St. Paul Island and the 616 blue and 1 white fox skins taken on St. George Island in the season of 1937–38 were shipped from the islands on the *Penguin*, sailing on March 15. The vessel reached Seattle on March 29, and the fox skins were forwarded by express to the Department's selling agents at St. Louis, Mo.

At the public auction sale in St. Louis on May 2, 1938, 501 blue and 1 white fox skins of the 1936–37 season's take were sold. The blue pelts brought $12,423.00, including $40 for one dressed skin, and the average selling price of the raw blue pelts was $24.77. The single white pelt was sold dressed for $15. One fine silvery pelt brought $85, which was the maximum price obtained for a single pelt.

On October 10, 1938, there were sold at public auction at St. Louis 423 blue and 16 white fox skins taken on the Pribilof Islands in the 1937–38 season. The blue pelts brought $10,295.00, an average of $24.34 per skin; and the white pelts sold for $216.00, or $13.50 each. The maximum price obtained was $72, for a single skin.

## FUR-SEAL PATROL

### UNITED STATES COAST GUARD

Vessels of the Coast Guard were again assigned by the Treasury Department to patrol waters along the route of the Alaska fur seals during their northward migration to the Pribilof Islands. Twelve cutters and patrol vessels were instrumental in enforcing the laws and regulations for the protection of fur seals and sea otters in the North Pacific and Bering Sea.

On March 15 the cutter *Onondaga* began the regular patrol of the Washington coast between the Columbia River entrance and the Strait of Juan de Fuca. Several preliminary cruises were made by this vessel prior to March 15, and as early as February 15 50 seals were sighted off Willapa Bay. The seal patrol activities of the *Onondaga* were continued until March 26, and were supplemented by frequent cruises of the patrol boat *Atalanta* in the Strait of Juan de Fuca and along the coast of Vancouver Island from March 14 to 31.

On April 1 the cutter *Redwing* relieved the *Onondaga* and continued the patrol northward from Vancouver Island to Dixon Entrance and Clarence Strait. The *Redwing* was relieved on April 20 by the cutter *Haida*, which patrolled the waters from southeast Alaska to Kodiak until May 5.

Vessels of the Coast Guard which participated in the seal patrol in the North Pacific west of Kodiak, and in Bering Sea, were the patrol boats *Alert* and *Ariadne* from April 20 to July 1 and July 10, respectively; the cutter *Haida* from May 31 to June 29; the cutter *Spencer* from April 20 to July 31; the cutter *Shoshone* from June 15 to August 15; the patrol boat *Reliance* from July 1 to September 10; the cutter *Redwing* from August 2 to September 10; the patrol boat *Cyane* from July 5 to September 20; and the cutter *Hamilton* from July 15 to November 1. The cutter *Northland* made its regular annual cruise to the Arctic Ocean, patrolling in Bering Sea and adjacent waters from May 20 to September 20.

### BUREAU OF FISHERIES

The Bureau of Fisheries vessel *Scoter* was assigned to patrol the waters off the coast of Washington, principally in the vicinity of Neah Bay, during the period of sealing operations by the native Indians. The *Scoter* maintained a patrol in this area from March 16 to April 12.

Morris Rafn and William B. Newcomb were detailed to Lapush, Wash., during the sealing season, as special agents of the Bureau to authenticate sealskins and to secure compliance with the treaty provisions which prohibit the use of firearms or motorboats in the taking of fur seals by the aborigines.

### SEALING PRIVILEGES ACCORDED ABORIGINES

The North Pacific Sealing Convention of July 7, 1911, permits Indians and other aborigines dwelling on the coasts of North America to hunt for seals by primitive methods. In 1938 there were taken and duly authenticated, by officials of the respective Governments, 1,551 fur-seal skins, of which 184 were taken by Indians under the jurisdiction of the United States and 1,367 by Indians of Canada. The details are as follows:

*Washington.*—A total of 92 sealskins were taken at Lapush and Neah Bay by the Indians of Washington State. Four of these skins were taken from male seals and 88 from females, during the months, of March, April, and May. The skins were authenticated by A. M. Rafn and W. B. Newcomb, special agents of the Bureau, and by Mr. Guy C. Coy, Collector of Customs at Neah Bay, acting as special agent of the Bureau of Fisheries.

*Alaska.*—Ninety-two sealskins were taken by the natives of Sitka during April and May, and were authenticated by Bureau employees. Of these skins, 2 were from male and 90 from female seals.

*British Columbia.*—Indians along the British Columbia coast took 1,367 fur-seal skins in 1938, according to an official report.

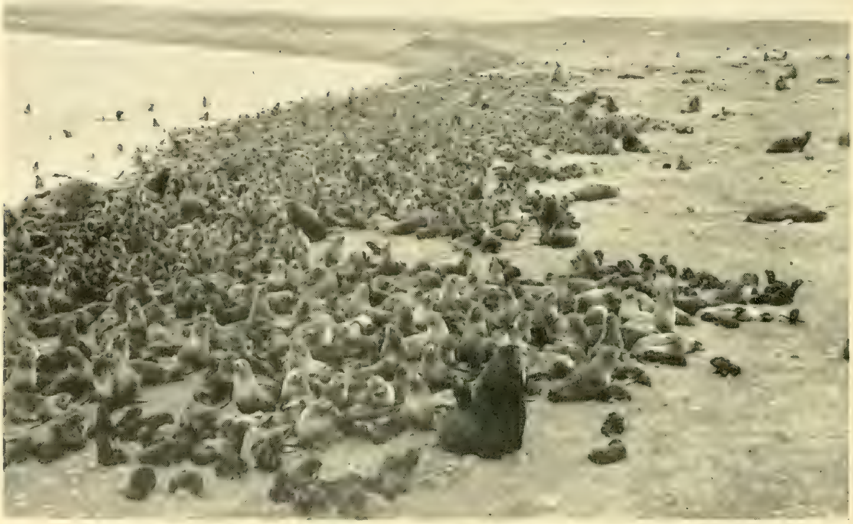

FIGURE 5.—Fur-seal harems on Polovina Rookery, St. Paul Island, Alaska.

### JAPANESE SEALSKINS DELIVERED TO THE UNITED STATES

Under the provisions of the fur-seal treaty of 1911, there were allotted to the United States 210 Japanese fur-seal skins, or 10 percent of the number taken by Japan on Robben Island in 1938. These skins were received by the Department's selling agents at St. Louis, Mo., on May 9, 1939.

### SUBSTATION FOR SEA-OTTER PATROL

The Bureau's work for the furtherance of sea-otter investigations and patrol was continued. At the substation established on Amchitka Island in 1937, 4 additional overnight cabins, 8 by 10 feet, were built on the south side of the island at 8-mile intervals. At the camp site in Constantine Harbor a 10 by 16-foot powerhouse was constructed, and a 5-horsepower diesel engine was installed for use as a power plant. Two radio masts were erected on concrete bases, and radio antennae were strung leading to a receiving set and a transmitter. Buildings that had been erected in the previous year were given a coat of paint.

The number of sea otters counted in the vicinity of Amchitka Island in 1938 was considerably less than the estimate for the previous year. Whether the difference was due to an error in the count or to a change in the habits and distribution of the animals was not known. It is anticipated that further light will be thrown upon this problem by investigations in succeeding years.

## COMPUTATION OF FUR SEALS, PRIBILOF ISLANDS, 1938

By Harry J. Christoffers

As indicated by the commercial killings, there was a satisfactory increase over the previous year in the number of 3-year-old male fur seals arriving at the Pribilof Islands in the 1938 season. A total of 54,140 3-year-olds were killed, compared with 50,800 in 1937 and 54,890 in 1935. The killings for the past several years, however, do not show a gain commensurate with an average increase of 8 percent in the size of the herd. It is evident, therefore, that during recent years the herd has not been increasing as fast as expected, in view of the increases apparent for the period from 1929 to 1931. This condition is probably due in part to insufficient additions to the breeding reserve as a result of continuing sealing operations for several days after July 23. It cannot be the entire cause, however. Unknown factors during the life of the seals at sea must have been partly the cause of the large increases from 1929 to 1931, and other unknown factors must have caused a greater loss of life at sea during more recent years. Disease or natural enemies would hardly be expected to increase directly in proportion to the growth of the herd. It would not be surprising, therefore, if there should be in any year an abnormally large increase in the number of 3-year-old males available for killing.

The St. George Island killings this year show a remarkable increase over those for the past 2 years, although only slightly more than the number killed in 1935.

During the last week of the season at St. Paul Island the 3-year-olds continued to come in increasing numbers. The number killed at that time, however, does not show the number which were available; as the rookeries were badly broken up, no seals were driven from the portions of rookeries having a considerable number of cows.

The experience this year, when a great many 3-year-olds arrived after the rookeries were broken up near the end of the season, indicates the advantage of killing 4-year-olds instead of 3-year-olds. A more definite portion of killable seals could be secured by killing from the 4-year-old class, as these animals arrive much earlier in the season. This would also result in driving a smaller number of cows, a very important point to be considered. Cows do not withstand driving to the same extent as young males. A great many of the cows driven probably die as a result of extreme exhaustion. As previously recommended, therefore, the killing of 4-year-olds still appears advisable, if it should be considered desirable from a commercial standpoint.

Through the courtesy of the Commander of the Bering Sea Patrol and the commanding officer of the Coast Guard cutter *Spencer*, an airplane made a trip from the village landing to Northeast Point and return. The plane passed over the Polovina rookeries en route and made several trips over the Northeast Point rookeries, for the purpose of ascertaining if it would be practicable to make a pup count by taking pictures from a plane. Motion pictures and still pictures were taken by the Coast Guard, but it appears that the value of such pictures in connection with a census of the fur seals is limited. The black rocks, on which most of the seals are found, are so dark that there is practically no contrast between them and the black pups. In addition, the pups are so small that they cannot be seen from a plane. The seals were not bothered in the least from the noise of the plane.

Adult sea lions, because of their light color, were easily distinguished from the plane, but all of them made a dash for the water when they heard the plane overhead.

## BULLS

Insofar as possible, a count was made of all harem and idle bulls. During the counting period at St. Paul Island, harems were increasing and cows were being held in place by the active harem bulls. A couple of days of warm weather, however, caused a break-up of the St. George harems before counts could be made. It was necessary, therefore, to apply to St. George the information obtained at St. Paul, after observing the actual harem areas occupied.

On certain St. Paul rookeries harem areas were greatly extended, while on others considerably less area was covered than in the previous year. Female seals prefer to crowd together as closely as possible. Therefore, the crowded areas grow faster and contain many more seals per square foot than other portions of the rookery which would appear to be more favorable for their requirements. A cow prefers to enter a large harem rather than to go to a bull with only a few cows or none at all. The favored harems finally become so large that the cows must enter another bull's domain. Then the unfavored one soon accumulates a much larger number.

This year, it will be noted, there was practically no increase in the number of harem bulls and there was a marked reduction in the number of idle bulls on rookeries. The reduced number of idle bulls was very noticeable from the beginning of the season. Very few surplus bulls took up idle-bull positions, and no trouble was experienced in making an accurate count of the idle bulls. The number recorded for St. Paul Island, therefore, is quite accurate. There appeared to be the usual number of full-grown, strong, and active surplus bulls on the hauling grounds, but they were not interested in taking up idle-bull positions. Though the shortage of idle bulls was very noticeable, it is not necessarily a matter of great importance, as there is no difference between an idle and a surplus bull except in the position he occupies. They may change places continually throughout the season. Usually, however, as soon as the idle bulls secure harems, surplus bulls move over from the hauling grounds to become idle bulls, so that there are always about the same number of idle bulls in the rear of the rookeries.

It is interesting to note that 3 bulls branded in 1923 were observed—1 on Polovina Cliffs rookery and 2 on Reef rookery. All were husky animals and held large harems in the center of the rookeries.

The decrease in the expected number of harem and idle bulls might possibly be due to the final dying off of the extra males reserved from 1923 to 1932. If so, there is a possibility of a shortage of bulls within the next few years. If the number of harem and idle bulls continues to decrease, it would be advisable each year to make an additional reserve of males.

*Estimated number of harem and idle bulls, approximate ratio of idle bulls to harem bulls, and average harem, 1938*

| Rookery | Date | Harem bulls | Idle bulls | Total | Approximate ratio of idle bulls to harem bulls | Average harem |
|---|---|---|---|---|---|---|
| St. Paul Island: | | | | | | |
| Kitovi | July 19 | 414 | 51 | 465 | 1:8 | 49.11 |
| Lukanin | do | 183 | 32 | 215 | 1:6 | 53.71 |
| Gorbatch | July 20 | 1,050 | 211 | 1,261 | 1:5 | 49.16 |
| Ardiguen | do | 96 | 17 | 113 | 1:6 | 50.86 |
| Reef | do | 2,100 | 308 | 2,408 | 1:7 | 49.38 |
| Sivutch | do | 475 | 60 | 535 | 1:8 | 66.80 |
| Lagoon | do | 2 | ---------- | 2 | ---------- | 26.50 |
| Tolstoi | July 19 | 1,200 | 163 | 1,363 | 1:7 | 50.86 |
| Zapadni | July 18 | 1,000 | 178 | 1,178 | 1:6 | 58.66 |
| Little Zapadni | do | 576 | 103 | 679 | 1:6 | 51.91 |
| Zapadni Reef | do | 69 | 17 | 86 | 1:4 | 15.03 |
| Polovina | July 17 | 464 | 112 | 576 | 1:4 | 45.44 |
| Polovina Cliffs | do | 369 | 88 | 457 | 1:4 | 31.28 |
| Little Polovina | do | 120 | 29 | 149 | 1:4 | 35.03 |
| Morjovi | do | 302 | 54 | 356 | 1:6 | 25.02 |
| Vostochni | do | 2,300 | 364 | 2,664 | 1:6 | 36.57 |
| Total | | 10,720 | 1,787 | 12,507 | 1:6 | 46.76 |
| St. George Island: | | | | | | |
| North | July 23 | 800 | 73 | 873 | 1:11 | 51.13 |
| Staraya Artil | do | 650 | 100 | 750 | 1:7 | 47.42 |
| Zapadni | do | 230 | 50 | 280 | 1:5 | 18.91 |
| South | do | 150 | 10 | 160 | 1:15 | 6.81 |
| East Reef | do | 185 | 35 | 220 | 1:5 | 50.66 |
| East Cliffs | do | 425 | 70 | 495 | 1:6 | 62.97 |
| Total | | 2,440 | 338 | 2,778 | 1:7 | 46.41 |
| Total (both islands) | | 13,160 | 2,125 | 15,285 | 1:6 | 46.69 |

A shortage of bulls will cause a reduction in the yearly rate of increase of pups. A larger number of surplus bulls can do no harm, except to make it a little more difficult to drive. If previous experience in reserving should be repeated, the increases of killable seals secured through making extra reserves would more than pay for itself within the next 5 years.

The albino bull, first observed in 1935, frequented the idle-bull area back of Reef rookery the greater part of the season. At no time was he observed with any cows.

## AVERAGE HAREM

The average harem is computed from the estimated number of cows and harem bulls. This year's figures indicate an increase in the average harem from 43.43 in 1937 to 46.69 in 1938. This increase should not cause any great concern, although a lower average harem would be preferable, as it would show that there were more than sufficient bulls.

It is felt that the more bulls there are on hand the faster the herd will increase. An extra large number of bulls does not now necessarily create a much smaller average harem. It would mean that as the season advances and the harem bulls become exhausted, or at least weaker, their places would be taken by stronger bulls not worn out from harem duties. The present system does not provide for any considerable replacement of harem bulls during the active breeding season.

*Computation of breeding cows, based on annual increase of 8 percent, and of average harem, in 1938*

| Rookery | Breeding cows | | Harem bulls, 1938 | Average harem | | |
|---|---|---|---|---|---|---|
| | 1937 | 1938 | | 1938 | 1937 | Increase (+) or decrease (−) in 1938 from 1937 |
| St. Paul Island | | | | | | |
| Kitovi | 18,824 | 20,[illegible] | 414 | 48.11 | 40.[illegible] | +8.06 |
| Lukanin | 9,151 | 9,[illegible] | 182 | 53.71 | 41.94 | +11.77 |
| Gorbatch | 47,736 | 51,[illegible] | 1,[illegible] | [illegible] | 47.[illegible] | +1.36 |
| Ardiguen | 4,521 | 4,[illegible] | [illegible] | [illegible] | 41.[illegible] | +5.61 |
| Reef | 96,007 | 103,[illegible] | 2,[illegible] | [illegible] | [illegible] | +1.15 |
| Sivutch | 29,879 | 31,729 | 475 | [illegible] | [illegible] | +1.51 |
| Lagoon (actual count pups) | 51 | [illegible] | 2 | [illegible] | [illegible] | +1.00 |
| Tolstoi | [illegible] | [illegible] | 1,[illegible] | [illegible] | [illegible] | +3.77 |
| Zapadni | [illegible] | [illegible] | 1,[illegible] | [illegible] | [illegible] | +11.43 |
| Little Zapadni | [illegible] | [illegible] | [illegible] | [illegible] | [illegible].14 | +5.77 |
| Zapadni Reef | [illegible] | 1,[illegible] | [illegible] | 15.03 | 15.24 | −.21 |
| Polovina | [illegible] | 11,082 | [illegible] | [illegible] | 44.97 | +.57 |
| Polovina Cliffs | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | +.74 |
| Little Polovina | [illegible] | 4,[illegible] | [illegible] | [illegible] | [illegible] | +2.66 |
| Morjovi | [illegible] | 7,[illegible] | [illegible] | [illegible] | [illegible] | +3.49 |
| Vostochni | [illegible] | [illegible] 114 | 1,[illegible] | [illegible] | [illegible] | +2.71 |
| Total | [illegible] 134 | [illegible] 284 | [illegible] | 46.76 | 43.42 | +3.34 |
| St. George Island | | | | | | |
| North | [illegible] | [illegible] | [illegible] | 51.[illegible] | 46.[illegible] | +4.94 |
| Staraya Artil | [illegible] | [illegible] | [illegible] | 47.42 | 43.91 | +3.51 |
| Zapadni | 4,[illegible] | 4,[illegible] | [illegible] | [illegible] | [illegible] | +1.22 |
| South | [illegible] | 1,[illegible] | 150 | 6.81 | [illegible] | +.36 |
| East Reef | 4,[illegible] | 4,[illegible] | 16[illegible] | 50.66 | 49.93 | +.73 |
| East Cliffs | 24,791 | 25,7[illegible] | 4[illegible] | 62.97 | 59.00 | +3.97 |
| Total | [illegible] | [illegible] | 2,[illegible] | 46.41 | 43.49 | +2.92 |
| Total both islands | [illegible] | [illegible] | [illegible] | 46.69 | 43.43 | +3.26 |

When man did not interfere and all males grew to maturity, a harem bull would be replaced after a short period of service by a stronger bull. This resulted in a stronger and better race and undoubtedly caused every cow to be properly served, with a resulting higher birth rate and possibly a smaller mortality rate.

On newly inhabited areas most of the harems were quite large. Below Hutchinsons Hill a single harem, covering a large area, contained at one time over a hundred cows. There were numerous strong, husky bulls without cows a short distance from the harem, but none of them seemed interested in securing any of the cows from this particular harem.

## PUPS AND COWS

The number of pups and cows was determined by applying the average rate of increase secured through actual pup counts made from 1917 to 1922. It is difficult to say whether there was an actual increase of approximately 8 percent, but observations would indicate that this estimate is somewhat high. The harems now cover such large areas that a normal increase in cows would not necessarily be readily observed from year to year, but should be easily discernible over a period of years. From year to year one area may show a large increase or a considerable decrease, as movements are not constant in any particular place.

*Distribution of pups on the Pribilof Islands, Aug. 10, 1938, and comparison with distribution in 1937*

| Rookery | 1938 | | | | Total pups, 1937 | Increase, 1938 |
|---|---|---|---|---|---|---|
| | Living pups | Dead pups | Total pups | Percent dead pups | | |
| St. Paul Island: | | | | | | |
| Kitovi | 20,081 | 299 | 20,380 | 1.47 | 18,824 | 1,556 |
| Lukanin | 9,616 | 213 | 9,829 | 2.17 | 9,101 | 728 |
| Gorbatch | 51,176 | 444 | 51,620 | .86 | 47,796 | 3,824 |
| Ardiguen | 4,766 | 117 | 4,883 | 2.39 | 4,521 | 362 |
| Reef | 102,174 | 1,514 | 103,688 | 1.46 | 96,007 | 7,681 |
| Sivutch | 30,955 | 774 | 31,729 | 2.44 | 29,379 | 2,350 |
| Lagoon | 53 | | 53 | | 51 | 2 |
| Tolstoi | 60,189 | 848 | 61,037 | 1.39 | 56,516 | 4,521 |
| Zapadni | 57,650 | 1,009 | 58,659 | 1.72 | 54,314 | 4,345 |
| Little Zapadni | 29,153 | 748 | 29,901 | 2.50 | 27,686 | 2,215 |
| Zapadni Reef | 1,028 | 8 | 1,036 | .80 | 959 | 77 |
| Polovina | 20,553 | 329 | 20,882 | 1.58 | 19,320 | 1,562 |
| Polovina Cliffs | 11,329 | 214 | 11,543 | 1.85 | 10,688 | 855 |
| Little Polovina | 4,098 | 105 | 4,203 | 2.51 | 3,892 | 311 |
| Morjovi | 7,382 | 150 | 7,532 | 2.02 | 6,966 | 566 |
| Vostochni | 82,369 | 1,750 | 84,119 | 2.08 | 77,888 | 6,231 |
| Total | 492,743 | 8,521 | 501,264 | 1.70 | 464,134 | 37,130 |
| St. George Island: | | | | | | |
| North | 40,354 | 573 | 40,927 | 1.40 | 37,877 | 3,050 |
| Staraya Artil | 30,075 | 797 | 30,872 | 2.58 | 28,589 | 2,283 |
| Zapadni | 4,300 | 49 | 4,349 | 1.12 | 4,027 | 322 |
| South | 1,003 | 18 | 1,021 | 1.76 | 945 | 76 |
| East Reef | 9,231 | 152 | 9,383 | 1.61 | 8,699 | 684 |
| East Cliffs | 26,364 | 399 | 26,763 | 1.49 | 24,781 | 1,982 |
| Total | 111,259 | 1,976 | 113,235 | 1.74 | 104,848 | 8,387 |
| Total (both islands) | 604,002 | 10,497 | 614,499 | 1.71 | 568,982 | 45,517 |

The number of dead pups did not appear to be proportionately any greater this year than in the past, but the evidence available is not conclusive. To anyone observing the great activity on closely crowded harem areas it would seem highly probable that the death rate of pups is somewhat greater than indicated. The pups in the front portions of the rookeries have in many places a long way to travel to reach the rear of the areas occupied by active harem bulls.

It was quite surprising to note the number of old cows in heat at the end of the season. Many of them had pups recently born. Theoretically the older cows should be bred the first part of the season. If not bred at the proper time they would no doubt come in heat a second time. This would result in the pup being born the following year at a later date than would be normal for the age of the cow.

## MORTALITY OF SEALS AT SEA

Considering the number of killable seals at the Pribilof Islands in the last few years, as well as general observations regarding the number of older bachelors and surplus bulls on the hauling grounds, it is advisable to increase the mortality rates of pups at sea. Accordingly, there have again been applied the mortality rates for pups which were used in 1925 and which were continued until 1929, when, as a result of additional reserves made in 1923 and 1924, the number of 3-year-old seals returning to the islands was so great that it was necessary to reduce these mortality rates. If present conditions do not improve, it will be necessary to increase mortality rates for several other ages of male seals and to reduce the percentage increase of pups and cows. There is a strong possibility that the mortality rates increase with the growth of the herd. However, past experience would indicate that the decrease in the rate of growth of the herd is more likely to be directly comparable to the percentage of animals killed. Observations indicated it was advisable to apply the larger mortality rate for pups to all ages up to and including the 5-year-old male class.

Mortality rates for female pups were increased from 40 percent to 45 percent and for males from 40 percent to 50 percent. Experience has shown that for all animals there is a greater death rate among young males than young females. It will be necessary to change mortality rates as new information regarding the life-history of seals is secured.

## COMPLETE COMPUTATION

The following summary shows the methods used in computing the number of animals in the Pribilof Islands seal herd in 1938. It will be noted that the mortality rate for female pups was increased from 40 percent to 45 percent and for male pups from 40 percent to 50 percent. In addition, figures carried over from 1937 for yearling females and for all males up to 6 years of age were altered to provide for the newly applied mortality rates from the year the animals were born.

*Complete computation of fur seals, Pribilof Islands, as of August 10, 1938*

| Class | St. Paul Island | St. George Island | Total |
|---|---|---|---|
| Pups, estimated | 501, 264 | 113, 235 | 614, 499 |
| Breeding cows, 3 years old and over, by inference | 501, 264 | 113, 235 | 614, 499 |
| Harem bulls, estimated | 10, 720 | 2, 440 | 13, 160 |
| Idle bulls, estimated | 1, 787 | 338 | 2, 125 |
| Yearlings, male and female, estimated: | | | |
| Females born in 1937 | 232, 067 | 52, 424 | 284, 491 |
| Natural mortality, 45 percent | 104, 430 | 23, 591 | 128, 021 |
| Yearling females, Aug. 10, 1938 | 127, 637 | 28, 833 | 156, 470 |
| Males born in 1937 | 232, 067 | 52, 424 | 284, 491 |
| Natural mortality, 50 percent | 116, 034 | 26, 212 | 142, 246 |
| Yearling males beginning 1938 | 116, 033 | 26, 212 | 142, 245 |
| Yearling males killed in 1938 | 13 | ----------- | 13 |
| Yearling males, Aug. 10, 1938 | 116, 020 | 26, 212 | 142, 232 |
| 2-year-olds, male and female, estimated: | | | |
| Yearling females, Aug. 10, 1937 [1] | 118, 186 | 26, 697 | 144, 883 |
| Natural mortality, 15 percent | 17, 728 | 4, 005 | 21, 733 |
| 2-year-old females, Aug. 10, 1938 | 100, 458 | 22, 692 | 123, 150 |
| Yearling males, Aug. 10, 1937 [1] | 107, 437 | 24, 270 | 131, 707 |
| Natural mortality, 17.5 percent | 18, 801 | 4, 247 | 23, 048 |
| 2-year-old males beginning 1938 | 88, 636 | 20, 023 | 108, 659 |
| 2-year-old males killed in 1938 | 1, 431 | 225 | 1, 656 |
| 2-year-old males, Aug. 10, 1938 | 87, 205 | 19, 798 | 107, 003 |
| 3-year-old males, estimated: | | | |
| 2-year-old males, Aug. 10, 1937 [1] | 80, 653 | 18, 111 | 98, 764 |
| Natural mortality, 12.5 percent | 10, 082 | 2, 264 | 12, 346 |
| 3-year-old males beginning 1938 | 70, 571 | 15, 847 | 86, 418 |
| 3-year-old males killed in 1938 | 42, 864 | 11, 276 | 54, 140 |
| 3-year-old males, Aug. 10, 1938 | 27, 707 | 4, 571 | 32, 278 |
| 4-year-old males, estimated: | | | |
| 3-year-old males, Aug. 10, 1937 [1] | 24, 754 | 4, 833 | 29, 587 |
| Natural mortality, 10 percent | 2, 475 | 483 | 2, 958 |
| 4-year-old males beginning 1938 | 22, 279 | 4, 350 | 26, 629 |
| 4-year-old males killed in 1938 | 1, 642 | 712 | 2, 354 |
| 4-year-old males, Aug. 10, 1938 | 20, 637 | 3, 638 | 24, 275 |
| 5-year-old males, estimated: | | | |
| 4-year-old males, Aug. 10, 1937 [1] | 15, 910 | 4, 316 | 20, 226 |
| Natural mortality, 10 percent | 1, 591 | 432 | 2, 023 |
| 5-year-old males beginning 1938 | 14, 319 | 3, 884 | 18, 203 |
| 5-year-old males killed in 1938 | 2 | ----------- | 2 |
| 5-year-old males, Aug. 10, 1938 | 14, 317 | 3, 884 | 18, 201 |
| 6-year-old males, estimated: | | | |
| 5-year-old males, Aug. 10, 1937 | 18, 567 | 3, 019 | 21, 586 |
| Natural mortality, 20 percent | 3, 713 | 604 | 4, 317 |
| 6-year-old males, Aug. 10, 1938 | 14, 854 | 2, 415 | 17, 269 |

[1] It was found necessary to apply mortality rates of 45 percent for female pups and 50 percent for male pups, instead of 40 percent in each case, as formerly. Adjustments were made in the figures for 1937, therefore, to take care of these increased mortality rates for female pups and yearlings, and for males up to and including 5 years of age.

*Complete computation of fur seals, Pribilof Islands, as of August 10, 1938*—Con.

| Class | St. Paul Island | St. George Island | Total |
|---|---|---|---|
| Surplus bulls, 7 years old and over, estimated: | | | |
| 6-year-old males, Aug. 10, 1937 | 12, 670 | 2, 518 | 15, 188 |
| Natural mortality, 20 percent | 2, 534 | 504 | 3, 038 |
| 7-year-old males, Aug. 10, 1938 | 10, 136 | 2, 014 | 12, 150 |
| Surplus bulls, Aug. 10, 1937 | (2) | (2) | 9, 140 |
| Natural mortality, 30 percent | | | 2, 742 |
| Remaining surplus for 1938 | | | 6. 398 |
| Breeding bulls of 1937 | 13, 205 | 2, 926 | 16, 131 |
| Natural mortality, 30 percent | 3, 962 | 878 | 4, 840 |
| 1937 bulls remaining in 1938 | 9, 243 | 2, 048 | 11, 291 |
| Breeding bulls of 1938 | 12, 507 | 2, 778 | 15, 285 |
| 1937 bulls remaining, deducted | 9, 243 | 2, 048 | 11, 291 |
| Increment of new bulls in 1938 | 3, 264 | 730 | 3, 994 |
| 7-year-old males computed for 1938 | 10, 136 | 2, 014 | 12, 150 |
| Surplus bulls computed for 1938 | | | 6, 398 |
| Total theoretical bull stock for 1938 | | | 18, 548 |
| New increment of breeding bulls deducted | | | 3, 994 |
| Surplus bulls in 1938 | | | 14, 554 |
| 50 percent deducted for losses due to natural causes and errors in loss percentages in previous years | | | 7, 277 |
| Surplus bulls, Aug. 10, 1938 | | | 7, 277 |

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[2] Estimates have been worked out, insofar as possible, to show approximately the number of seals of each class which should be credited to each island. The seals, however, do not haul out in accordance with figures given. Seals born on either island frequent the other island. They travel promiscuously between the two islands and haul out on either one. The total for both islands, however, is approximately correct.

*Recapitulation*

| Class | Total | Class | Total |
|---|---|---|---|
| Pups | 614, 499 | 5-year-old males | 18, 201 |
| Cows | 614, 499 | 6-year-old males | 17, 269 |
| Harem bulls | 13, 160 | Surplus bulls | 7, 277 |
| Idle bulls | 2, 125 | | |
| Yearling females | 156, 470 | Total, 1938 | 1, 872, 438 |
| Yearling males | 142, 232 | Total, 1937 | 1, 839, 119 |
| 2-year-old females | 123, 150 | | |
| 2-year-old males | 107, 003 | Numerical increase, 1938 | 33, 319 |
| 3-year-old males | 32, 278 | Percent increase, 1938 | 1. 81 |
| 4-year-old males | 24, 275 | | |

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U. S. DEPARTMENT OF COMMERCE
HARRY L. HOPKINS, Secretary
BUREAU OF FISHERIES
CHARLES E. JACKSON, Acting Commissioner

Administrative Report No. 37

# FISHERY INDUSTRIES OF THE UNITED STATES

## 1938

By R. H. FIEDLER

APPENDIX III TO REPORT OF COMMISSIONER OF FISHERIES
FOR THE FISCAL YEAR 1939

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1940

For sale by the Superintendent of Documents, Washington, D. C. - - - - Price 35 cents

## ADMINISTRATIVE REPORT SERIES

Since the beginning of the Administrative Report Series, considerable confusion has arisen concerning the system of numbering the separates composing it. Inasmuch as the Reports of the Divisions vary in order from year to year, many have found their designations as "Appendix No. I, II, III, or IV" very confusing. To relieve this, it has been decided to number them as "Administrative Report No. —." Inasmuch as 20 separates had already been printed in this series before starting the numbers, it was deemed advisable to begin the numbering with Administrative Report No. 21. Of course, numbers cannot be printed on those already off the press, but for the information of those who wish to know what the first 25 were, they are numbered for filing purposes as follows:

No. 1. Report, Commissioner of Fisheries, 1931.
No. 2. Alaska Fishery and Fur-Seal Industries, 1930.
No. 3. Fishery Industries of the United States, 1930.
No. 4. Progress in Biological Inquiries, 1930.
No. 5. Propagation and Distribution of Food Fishes, 1931.
No. 6. Report, Commissioner of Fisheries, 1932.
No. 7. Alaska Fishery and Fur-Seal Industries, 1931.
No. 8. Fishery Industries of the United States, 1931.
No. 9. Progress in Biological Inquiries, 1931.
No. 10. Propagation and Distribution of Food Fishes, 1932.
No. 11. Alaska Fishery and Fur-Seal Industries, 1932.
No. 12. Progress in Biological Inquiries, 1932.
No. 13. Fishery Industries of the United States, 1932.
No. 14. Propagation and Distribution of Food Fishes, 1933.
No. 15. Fishery Industries of the United States, 1933.
No. 16. Alaska Fishery and Fur-Seal Industries, 1933.
No. 17. Progress in Biological Inquiries, 1933.
No. 18. Propagation and Distribution of Food Fishes, 1934.
No. 19. Alaska Fishery and Fur-Seal Industries, 1934.
No. 20. Fishery Industries of the United States, 1934.
No. 21. Progress in Biological Inquiries, 1934.
No. 22. Propagation and Distribution of Food Fishes, 1935.
No. 23. Alaska Fishery and Fur-Seal Industries, 1935.
No. 24. Fishery Industries of the United States, 1935.
No. 25. Propagation and Distribution of Food Fishes, 1936.

Note that the last Commissioner's Report was for 1932. Since then its place has been taken by a reprint from the report of the Secretary of Commerce under the title "Bureau of Fisheries." Inasmuch as it is no longer a Bureau publication, it is not numbered; but it will be supplied to any who request the Report of the Commissioner for any year since 1932.

# FISHERY INDUSTRIES OF THE UNITED STATES, 1938 [1]

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By R. H. Fiedler, *Chief, Division of Fishery Industries*

## CONTENTS

Page
Foreword 170

**Part 1.—Operations of the Division**

Cooperation with other Federal agencies 170
Cooperation with State agencies 171
Cooperation with Fishery Advisory Committee 173
Cooperative Pan-American fishery research 173
Exhibits at expositions 174
Economic and marketing investigations 174
Surplus-fish situation 174
Survey of retail marketing of fish and shellfish 176
Commercial fisheries of the world 176
The rosefish fishery of New England 176
Cod fisheries off the East coast of North America 177
Sources and supplies of sturgeon 177
Statistical investigations 178
Biological aspect 178
Economic aspect 179
Surveys conducted 179
Fishery market news service 180
Field offices 181
New York, N. Y 182
Boston, Mass 191
Chicago, Ill 193
Seattle, Wash 195
Jacksonville, Fla 198
Cooperative marketing 199
Technological investigations 200
Laboratories 200
Preservation of fishery products for food 201
Studies of rancidity in fish 201
Studies of lactic acid as a possible index of decomposition in frozen fish 202
Identification of canned salmon 203
Changes in the composition of pink salmon (*Oncorhynchus gorbuscha*) 203
Composition of commercial species of fish taken on the Pacific Coast 203
Canning aquatic products 204
Bacteriological studies 205
Studies of ultraviolet rays in killing bacteria 205
Studies in the handling of fresh oysters 205
Studies of methods of preparing crab meat 206
Pharmacological studies 206
Chemical and pharmacological studies of the fluorine in fishery products 206
Possible toxic properties of certain fish meals 207
Manufacture of fishery byproducts 208
Utilization of salmon cannery trimmings 208
Studies on the peroxide test as a measure of oxidative deterioration of fish oil 209
Utilization of fish livers and visceral organs 210
Preparation of fish meals of improved nutritional value 210
Studies on fat in fish meal 211
Chemical preservation of fish and fish waste 211
Nutritive value of aquatic products 212
Mineral constituents of fishery products 212
Chemical composition and nutritive value of fish proteins 212
Vitamin content of fishery products 213
Sodium alginate (produced from sea kelp) as a stabilizer in products of the dairy industry 213
Kelp meal in animal feeding 213
Research associates and student assistants 214
Page
Educational and consulting service 215
Publications of the Division 215
Documents, reports, and circulars 216
Special articles and addresses 216
Statistical bulletins 217

**Part 2.—Fishery Statistics, 1937**

General review 218
Manufactured fishery products 232
Canned fishery products and byproducts trade 238
Frozen fish trade 249
Fish, frozen 249
Holdings 251
Cold-storage holdings of cured fish 253
Foreign fishery trade 254
Fisheries of the New England States 258
Maine 269
New Hampshire 275
Massachusetts 275
Rhode Island 285
Connecticut 291
Vessel fisheries at principal New England ports 298
Economic aspect 298
Biological aspect 307
Mackerel fishery of the Atlantic coast 322
Fisheries of the Middle Atlantic States 325
New York 333
New Jersey 344
Pennsylvania 356
Delaware 356
Shad fishery of the Hudson River 361
Fisheries of the Chesapeake Bay States 361
Maryland 366
Virginia 374
Shad and alewife fisheries of the Potomac River 389
Trade in fishery products in Washington, D. C 390
Fisheries of the South Atlantic and Gulf States 390
North Carolina 400
South Carolina 410
Georgia 414
Florida 418
Alabama 436
Mississippi 439
Louisiana 442
Texas 447
Fisheries of the Pacific Coast States 452
Washington 460
Oregon 467
California 471
Halibut fishery of the Pacific coast 489
Vessel fisheries at Seattle, Wash 491
Lake fisheries 495
Fisheries of the Mississippi River and tributaries 516
Lake Pepin 522
Lake Keokuk 523
Mississippi River between Lake Pepin and Lake Keokuk 524
Fisheries of Alaska 526
Whaling 534
Statistical survey procedure 538
Sectional surveys 538
Local and special surveys 544
Practices and terms 547
Conversion factors 548
Common and scientific names of fishery products 550

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[1] Administrative Report No. 37, Appendix III to the Report of the Commissioner of Fisheries, 1939. Approved for publication, June 12, 1939.

## FOREWORD

This report constitutes a summary of the activities of the Division of Fishery Industries, as well as a review of the fishery statistics collected by the Division during the past year. As its name indicates, this Division of the Bureau is concerned with the activities and welfare of the commercial fisheries and fishery industries and the fishermen and shoresmen engaged therein; the fish canning and preserving industries; and the trade in fishery products. Its functions include the conduct of studies or activities: (1) To determine the extent and magnitude of our aquatic resources and the commercial importance of our fishery industries; (2) to learn the economic condition of fishermen and shoresmen engaged in the fishery industry, their place in the national economy, and what measures can be taken to improve their well-being; (3) to determine the character, utility, and effectiveness of different forms of fishing apparatus and vessels, suggest improvements therein, and discourage the use of those forms which are unnecessarily destructive or unprofitable; (4) to learn the effect of fishing on the supply of fish and suggest measures to promote orderly and sustained production; (5) to study and develop fisheries for hitherto unutilized fishes; (6) to investigate the preservation of fishery products, suggest improved methods, and discourage wasteful practices in this field; (7) to ascertain what use can be made of aquatic products not now utilized to economic advantage; (8) to inquire into the nutritive value of aquatic foods for man and his domestic animals, and promote the consumption of these foods; (9) to ascertain the means and methods of transporting fishery products on land and sea and recommend economical practices; (10) to inquire into the condition and extent of the wholesale and retail trade in fishery products and promote the more orderly marketing of our fishery harvest; (11) to introduce useful foreign methods or processes of capture, preservation, utilization, or marketing fishery products; (12) to handle matters relative to the administration of the act which authorizes cooperative associations of producers of aquatic products; and (13) to conduct the fishery market news service authorized by act of Congress in 1937.

Results of the various technological, economic, and marketing investigations carried on by the Division are published in separate documents as each project is completed, and a brief résumé of each current project is contained in this report. Information obtained from statistical surveys is published in part 2 of this report, which includes all the detailed statistical information that has become available since issuance of the previous report [2] together with such summarized statements and interpretations of the statistics as are deemed significant and useful.

## Part 1. OPERATIONS OF THE DIVISION

### COOPERATION WITH OTHER FEDERAL AGENCIES

It has been the established policy of the Bureau of Fisheries and of this Division to cooperate with other Federal agencies wherever the activities are such that mutual information can be exchanged with advantage or where, by working cooperatively, the results of such mutual work may be furthered or its ends made more effective and valuable.

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[2] Fishery Industries of the United States, 1937, by R. H. Fiedler: Appendix III to the Report of the U. S. Commissioner of Fisheries for 1938, pp. 151-460.

Thus, the technologists of this Division gave courses in canning fishery products to State Extension Service workers at the request of and with the cooperation of the Extension Service of the United States Department of Agriculture. Demonstrations and practical instruction on other related subjects, pertaining to the preservation of fishery products and a better utilization of the excellent food value of fish, were given to State Extension Service workers through and with the cooperation of the Extension Service of the United States Department of Agriculture. In some cases, students or State Extension Service workers were detailed to the Bureau's laboratories in Washington, D. C., for instruction, and in other cases one of our technologists visited some of the States for this purpose.

Cooperation was also given by members of our technological staff to chemists and bacteriologists of the Food and Drug Administration, United States Department of Agriculture, at various times in connection with the development and application of tests or methods of determining the quality and constituents of various fishery products.

On several occasions members of the Division's economic and marketing staff cooperated with the Department of Labor in holding conferences with fishermen's unions and associations to settle disputes. The Department of Labor, through its Employment Service, also gave considerable aid to the Division in selecting personnel for the conduct of the Division's survey of retail fish markets.

The Division also has worked with various Federal agencies in obtaining statistical data on our fisheries. In a cooperative arrangement, the Bureau of Agricultural Economics, Department of Agriculture, furnished statistics on the volume of cold-storage holdings of fish and quantities frozen, and the health authorities in Washington, D. C., assisted in obtaining data on the volume of fish handled at the Municipal Fish Wharf and Market in this city. Cooperation was accorded the Bureau of the Census in obtaining for that Bureau figures on the volume of the quarterly production and holdings of fish oils in the United States.

In addition to the specifically enumerated instances of cooperation with other Federal agencies cited above, which are on a continuing basis or were of a more detailed nature, it should be stated that a very close relationship exists between this Division and many of those Federal agencies whose duties require an interest in fish in particular, foodstuffs or feedstuffs in general, or in various marine activities. The staff of the Division is in almost daily contact with some one or more of these Federal agencies in the exchange of information of inestimable value to the scientific work of the Federal establishment.

## COOPERATION WITH STATE AGENCIES

The Division has continued to encourage cooperative relations with State institutions and agencies in the conduct of researches and investigations of mutual interest. This policy has resulted in expanded programs and decreased costs. During 1938 the following cooperative investigations with various States were conducted:

At Washington State College, Pullman, Wash., the Seattle technological laboratory staff of this Division worked with Dr. J. S. Carver in connection with tests on the feeding of fish oils and fish meals to poultry. Our Seattle technological laboratory staff also continued its close cooperative relation with members of the faculty and staff of the University of Washington, Seattle, Wash., as in past years.

The University of Maryland and the Maryland State Agricultural Experiment Station, College Park Md., continued their excellent cooperative relations with our College Park technological laboratory staff. Additional free space for the Bureau's laboratories was provided by the University of Maryland for the expanded technological work of the Bureau at that place. For example the use of another room was donated to the Division for the establishment of a new bacteriological laboratory in the Horticultural Building of the University. The various departments of animal husbandry of the Maryland State Agricultural Experiment Station continued their cooperation in the conduct of feeding tests of fishery byproducts in the rations of farm animals. The members of the staffs of these two institutions who have worked closely with our College Park technological staff are Dr. L. B. Broughton, Head of the Chemistry Department; Dr. W. C. Supplee and Mr. L. E. Bopst of the Chemistry Department; Dr. L. H. James, Head of the Department of Bacteriology; and Prof. M. H. Berry of the Dairy Department. These various cooperative studies are described in greater detail elsewhere in this report.

As discussed in the 1937 report, the Bureau's technologists continued their cooperation with the Virginia State Division of Markets in extending and improving State marketing grades for fishery products sold in that State.

The Bureau's economists and marketing specialists are working in close cooperation with the Division of Markets of the Virginia State Department of Agriculture and Immigration in connection with the survey of retail fish markets which is discussed elsewhere in this report. The Division of Markets furnished the services of a man who surveyed the retail fish markets in Harrisonburg, Staunton, Lexington, Roanoke, Lynchburg, and Charlottesville. These markets could not otherwise have been covered.

In the conduct of its statistical research work the Bureau obtains unusual cooperation from various States. The statistical surveys of the fisheries in the States bordering on the Great Lakes, in the Pacific Coast States, and in New York, Maryland, and Virginia have been greatly facilitated by the cooperation obtained from the fishery agencies in these States. With this aid it is now necessary for the Bureau to conduct only partial surveys in these States to supplement the data available from the fishery agencies. A comprehensive system for the collection of fishery statistics in the State of Maine is now being developed by the State of Maine in cooperation with members of the Bureau's staff.

In addition, in nearly every other State where commercial fishing is prosecuted, some type of cooperation in its statistical work is rendered the Bureau by the State fishery agencies or other organizations. This makes it possible for the Bureau to make statistical surveys of a greater portion of our fishery industries than otherwise would be possible.

## COOPERATION WITH FISHERY ADVISORY COMMITTEE

The Division of Fishery Industries offered its fullest assistance during the year to the Fishery Advisory Committee for the Department of Commerce. Facts and figures upon the scope and conditions of the fisheries are not readily apparent except through the data collected and compiled by the Bureau of Fisheries and for this reason the success of the meetings of this Committee is partially reliant upon cooperative assistance of the Bureau's staff.

During the fiscal year the Fishery Advisory Committee held two official meetings. The first of these occurred on October 5, 1938, in Boston. This meeting was held in conjunction with the National Fishery Convention which was held in Boston during the first week of October. The division contributed to the deliberations of this meeting, furnishing summaries of activities and problems as well as assisting in the program of the meeting and in its publicity.

Assistance was also furnished the Committee in its second meeting, which was held on January 30 and 31, 1939, in the Department of Commerce Building in Washington. The full technical personnel of the Washington area was made available for consultation at this meeting. An outline of fishery problems and the Bureau's activities in relation thereto provided the foundation of the Committee's program.

The meetings resulted in the passage of resolutions, concerning the operations of the Division of Fishery Industries, which endorsed the enlargement of the Market News Service; recommended a thorough study of retail fish marketing; and urged the establishment of an extension service and the making of quality and consumption studies by the Bureau;

## COOPERATIVE PAN-AMERICAN FISHERY RESEARCH

At the request of Dr. Ernest Gruening, Director of the Division of Territories and Island Possessions of the Department of the Interior, the writer was detailed as adviser on fishery matters to accompany the President's Educational Commission to Puerto Rico. The commission conducted a study of the University of Puerto Rico with the view of developing this university into a Pan-American institution. This project was recommended to President Roosevelt by his Committee on Cooperation with Latin America, and was approved by him. The commission was headed by President Isaiah Bowman of The Johns Hopkins University.

Our neighbors to the south are constantly asking us for assistance in the field of fisheries. In view of this, it appeared desirable to explore the place and need for a school of fisheries or fishery research laboratory at the proposed Pan-American institution in Puerto Rico which could serve as a focal point for fishery education to students from the Americas and the West Indies.

The development of a fishery school or research laboratory also would round out a program of scientific cooperation with Latin America which already has had its beginnings in a School of Tropical Medicine. This school is conducted under the joint auspices of the University of Puerto Rico and Columbia University. Plans are also under way for the development of graduate schools of tropical forestry and tropical agriculture.

The commission left New York City for Puerto Rico on April 6 and returned April 24, 1939. Its findings and recommendations have been reported to the President.

## EXHIBITS AT EXPOSITIONS

During 1938 the Division of Fishery Industries finished arrangements for a Bureau of Fisheries display for the Pan-American Exposition at Tampa, Fla., and planned the participation of the Bureau in the "theme" exhibits for the New York World's Fair, 1939. The display at Tampa consisted of a diorama of the sponge-fishing industry. At the New York Fair the Bureau was represented in the following dioramas: Conservation, Food, Industry, Recreation, and Territories. Displays also were shipped to San Francisco for the use of Fair authorities at that city in the Golden Gate International Exposition. These consisted of illuminated panels depicting the migration of the Alaska salmon in the Pacific Ocean and the American and European eels in the Atlantic Ocean. The Bureau also was represented in the Conservation theme at this Fair.

The publicity attendant upon the public showing of displays depicting the Bureau's activities and operations in the fishery industries is recognized as an important factor in the public relations of the Bureau of Fisheries.

## ECONOMIC AND MARKETING INVESTIGATIONS

There is a constant demand upon the Division of Fishery Industries to conduct economic studies of the commercial fisheries, including investigations having application to the various functions of marketing fishery commodities. It has been possible to undertake only a limited program of long-time or continuing studies of this kind with available personnel and funds during recent years. However, as is customary each year, many short-time economic and marketing studies were made in order to satisfy the urgent demands placed upon the Division. Some of these studies are conducted preliminary to or closely associated with administrative activities of the Bureau and, consequently, they are frequently not published. Some of the economic and marketing studies which were made during the past year are discussed briefly in the following paragraphs.

### SURPLUS-FISH SITUATION

As a result of the legislation incorporated in Public Act 542, which was approved on May 25, 1938, the Federal Surplus Commodities Corporation, during the latter part of the fiscal year 1938, purchased 3,595,000 pounds of fish and fish products at a commodity cost of about $265,000. These purchases consisted largely of pollock, haddock, cod, mackerel, blue runner, hake, and squeteagues or "sea trout." It will be recalled that 12,059,000 pounds of fishery products were purchased, at a commodity cost of $597,000, during the latter part of the fiscal year 1937 under similar authority. These costs do not include handling and transportation.

Fishery commodities purchased by the Federal Surplus Commodities Corporation were diverted from the normal channels of trade and commerce by their distribution through Federal, State, and private relief agencies.

A study of the situation with respect to surplus fish was made by the staff of the Division during April and May 1939. The findings of this study were presented by the writer on May 31, 1939, before the Committee on Merchant Marine and Fisheries of the House of Representatives in connection with the deliberations of that Committee on H. R. 5025 and 5681.

The former of these bills had for its purpose the provision of temporary measures for the further purchase of fishery products for distribution to relief clients, while H. R. 5681 was designed to furnish permanent provision for the removal of surplus fishery commodities from the normal channels of trade and commerce.

The study made in the Division developed the following information:

*Frozen and cured fish.*—The holdings of frozen fishery products in cold-storage warehouses in the United States on April 15, 1939, amounted to 29,744,000 pounds, compared with 37,367,000 pounds on the same date the previous year. This is 882,000 pounds in excess of the normal or 5-year average of the holdings as of April 15, which amounted to 28,862,000 pounds.

The excess holdings as of April 15, 1939, over the 5-year average for this date consisted principally of shellfish, largely shrimp originating from the South Atlantic and Gulf coast; shad from the Atlantic coast; sablefish from the Pacific coast; and various fresh-water fish from the Great Lakes.

On April 15, 1939 the cold-storage holdings of cured herring amounted to 15,670,000 pounds, compared with 15,082,000 pounds on the same date in 1938 and the 5-year average of 12,229,000 pounds as of April 15.

Cold-storage holdings of mild-cured salmon on April 15, 1939, amounted to 3,529,000 pounds, compared with 2,719,000 pounds on the same date a year ago and the 5-year average of 3,116,000 pounds as of April 15.

*Canned fish.*—Holdings of canned salmon in the hands of packers, according to a report of the Association of Pacific Fisheries, Seattle, Wash., amounted to 2,032,591 standard cases of 48 1-pound cans per case on February 28, 1939. This is a decrease of 1,396,000 cases, or 67,000,000 pounds, as compared with the holdings on the same date the previous year.

Data obtained by telegram from members of the industry showed that holdings of canned tuna on March 15, 1939, amounted to 9,600,000 pounds, or approximately 6,000,000 pounds less than a year ago, while those of California sardines aggregated 7,900,000 pounds, or 3,100,000 pounds more than on the same date the previous year. Current holdings of canned shrimp amounted to 4,500,000 pounds which were almost identical with the holdings a year ago, and those of canned oysters were 2,600,000 pounds, or 800,000 pounds greater than in the preceding year. It is reported that there were no stocks of Maine sardines in packers hands on March 15 this year, but last year holdings of this product totaled about 8,000,000 pounds.

*Summary.*—The holdings in the spring of 1939 of all of the types of edible fishery products outlined above aggregated about 172,000,000 pounds compared with 256,000,000 pounds as of comparable dates a year ago. The holdings this year represented an excess of about 5,600,000 pounds over normal holdings for this time of the year.

## SURVEY OF RETAIL MARKETING OF FISH AND SHELLFISH

Following an intensive preliminary study to determine the most efficient procedure and coverage, a survey of retail marketing of fish and shellfish was undertaken in March 1939 under the direction of Ralph Russell, Associate Fishery Economist, to include about 50 representative cities east of the Mississippi River.

The annual domestic per capita consumption of fish amounts to only 13 pounds; less than that of most of the important countries of the world. This low consumption not only curbs the potential growth of our commercial fisheries but also is evidence of the restricted volume of these healthful foods in the average diet. Recent studies indicate wide variations in the consumption of fish among various cities as well as among the various social and economic groups of residents of these cities.

It is the purpose of this survey to study the conditions under which fish are sold in retail markets. To accomplish this, the Bureau's investigators are interviewing a large number of dealers representing all segments of the retail trade to obtain information on retail methods, equipment used, prevalence and nature of advertising, consumer preference and response, location of retail outlets, and characteristic as well as unusual merchandising practices and selling methods. The field work of this survey will continue until about the end of June 1939, after which the results of the survey will be tabulated and analyzed to determine the factors which lead to the most favorable response from the public and to establish criteria which may guide retailers toward those practices which are most successful or promising. It is expected that one or more reports will be published following the completion of this work.

## COMMERCIAL FISHERIES OF THE WORLD

The world's annual catch of fishery products, based on the most recent available data, amounts to about 33,600,000,000 pounds, valued at $740,000,000. The United States, including Alaska, with a catch valued at $93,000,000, leads the countries of the world in the annual value of its yield. Japan's annual catch, valued at $87,000,000, ranks second. Other countries, the annual catch of which exceeds $50,000,000 in value are, in order of their importance, Union of Soviet Socialist Republics; England, including Scotland, Northern Ireland, and Wales; China; and France. Japan, with a catch of 6,600,000,000 pounds, leads in the annual volume of the catch among the countries of the world. Following is the United States with a catch aggregating 4,800,000,000 pounds. Other countries whose annual catches exceed 1,500,000,000 pounds are, in order of their importance, Union of Soviet Socialist Republics; China; England, including Scotland, Northern Ireland, and Wales; Norway; and Germany.

## THE ROSEFISH FISHERY OF NEW ENGLAND

The rosefish or "redfish" fishery of New England experienced another good year in 1938 from the standpoint of total yield, although the average value to the fisherman decreased to 1.2 cents per pound from

1.5 cents in the previous year. Landings of this species at the ports of Boston and Gloucester, Mass., and Portland, Maine, aggregated 64,700,000 pounds in 1938 as compared with 58,300,000 pounds in 1937, and the all-time high of 66,600,000 pounds in 1936. It will be recalled that prior to the intensive exploitation of this fishery in 1935 the rosefish was of little importance as a commercial species. The entire landings at the three above-mentioned principal New England ports amounted to only 57,000 pounds in 1932.

During the 4 years beginning in 1935, in which this fishery has been one of importance, Boston has received about 67 percent of the landings, Gloucester 32 percent, and Portland 1 percent. However, during these 4 years the relative importance of the individual ports in the receipts of rosefish has undergone considerable change. The landings at Boston, while amounting to 49,400,000 pounds in 1936, decreased to 34,100,000 pounds in 1938. The landings at Gloucester amounted to 17,000,000 pounds in each of the years 1936 and 1937 but increased sharply to 29,400,000 pounds in 1938. The receipts of this species by vessels at Portland have increased from 70,000 pounds in 1935 to 1,150,000 pounds in 1938.

While rosefish are taken widely throughout the fishing banks of the North Atlantic, the Western Side of South Channel alone contributed 35 percent of the landings at these three New England ports during 1937. Other fishing areas of especial importance as contributors to the landings at these three ports were as follows: Southern Nova Scotia 21 percent, Brown's Bank 20 percent, Eastern Side South Channel 11 percent, Inner Grounds 5 percent, and Western Nova Scotia 3 percent. Virtually the entire catch of rosefish is made by otter trawls.

## COD FISHERIES OFF THE EAST COAST OF NORTH AMERICA

The average annual catch of cod off the East coast of North America for the 10-year period from 1926 to 1935, inclusive, amounted to 1,108,000,000 pounds, as compared with an annual average of 1,169,000,000 pounds for the preceding 10-year period, according to a report prepared by Edward A. Power, Associate Statistician and the writer, for the use of the North American Council on Fishery Investigations. The present study brings up to date Fisheries Document No. 1034 entitled "Statistics of the Catch of Cod Off the East Coast of North America to 1926," by Oscar E. Sette, which includes available data on the cod fishery prior to 1927. In 1935, the most recent year for which complete statistics are available, the catch of cod in this region amounted to 1,109,000,000 pounds. The cod fisheries off the East coast of North America are prosecuted by the nationals of no less than five countries. The most important among these, with respect to the annual volume of fish taken, is Newfoundland, the catch of which in the years from 1931 to 1935, inclusive, averaged 495,000,000 pounds. Following in order were Canada, which produced an average of 192,000,000 pounds annually during the same period; France, 127,000,000 pounds; United States, 109,000,000 pounds; and Portugal, 40,000,000 pounds.

## SOURCES AND SUPPLIES OF STURGEON

Imports of sturgeon into the United States have been consistently decreasing in recent years. In 1931 receipts of sturgeon from foreign countries amounted to 3,435,000 pounds, but decreased to 1,744,000 pounds in 1934 and 1,184,000 pounds in 1938. This decline in imports is reflected principally in receipts from the Soviet Union which is the principal source of supply. Where imports from the Soviet Union amounted to 1,605,000 pounds in 1934, they decreased to 750,000 pounds in 1938.

Contrasted with the decline in receipts of sturgeon from the Soviet Union are the steadily increasing imports from Canada. Such imports amounted to only 124,000 pounds in 1934, but had increased to 353,000 pounds in 1938. Receipts from Canada were augmented during the latter part of 1938 by the development of a new source of supply in the Albany River in northern Ontario. According to a report from Warwick Perkins, American Consul at Toronto, Canada, the capture of sturgeon in this river in the past has been incidental to fisheries for other species, but, due to the high unit value of sturgeon, it has been found profitable to prosecute a fishery specifically for this fish, transporting the catch by aircraft to Nakina for transshipment on the Canadian National Railways.

It is of interest to observe that imported sturgeon furnishes our principal supply, since the domestic annual catch has averaged less than 300,000 pounds in recent years.

## STATISTICAL INVESTIGATIONS

Fishery statistics are collected by the Bureau to serve two principal purposes—biological and economic. For this reason the Bureau plans its statistical surveys to obtain comprehensive data for furnishing a complete and reliable picture of the condition and trend of the fisheries. The collection and compilation of the great mass of data necessary involves many problems. The fisheries are broad in scope, including over 160 varieties of aquatic products which enter into commercial production. These, many of which are migratory, are taken by a great variety of types of gear in areas along our seacoast and in our interior lakes and streams. If the biological aspect is to be served, complete annual statistics are needed on each of these phases in every section. If the economic aspect is to be served, statistics are needed not only on the phases listed above relative to the biological aspect, but also on the price structure, the processing function, and on marketing and distributing.

It is essential that statistics on these latter phases of the industry be collected and published as soon as possible after the close of the business transactions in order that they may be of maximum value to the fishery industry and other interested parties.

### BIOLOGICAL ASPECT

The biological aspect must consider two problems—the conservation and sustained supply of the resource, and the prediction of future trends or yields. Since the fisheries are usually prosecuted in areas not under private ownership, the problem of the conservation of these fisheries is of national concern. It is important that close watch be kept of the condition of the various fisheries to detect depletion so that remedial measures can be promulgated timely and wisely. For this reason it is imperative that current statistical data be obtained on the yield of our fisheries.

These statistics furnish the biologist with the background upon which to base his prediction of future trends and yields. This he does by coupling the statistical data with studies of the life history of the species. Difficulty is experienced in making these predictions because the supply (population) of the species cannot be seen, as is the case with farm animals or crops. The more complete and more reliable the statistics on yield are, the better foundation the biologist has for conducting his studies. The Bureau, therefore, aims to obtain a complete picture of each individual fishery to further these biological studies.

## ECONOMIC ASPECT

When the fishery has been conserved, and trends and yields of the fishery have been predicted, the problem still remains of supplying the fishery trade with the information so essential to the conduct of its business activities. In these days of increased competition the very existence of the fishery industry must depend upon reliable economic and statistical information. Such material has been especially valuable during the past few years, when it has been used in national planning. The Bureau endeavors to make its statistical surveys so complete that the industry and the various governmental organizations may turn to it for reliable fishery statistics.

## SURVEYS CONDUCTED

The statistical surveys during 1938 were conducted under the immediate supervision of Edward A. Power, Associate Statistician, and the general direction of Fred F. Johnson, Assistant Chief of the Division. These surveys included the collection and dissemination of statistics of the commercial catch and its value, fishing craft and apparatus, and employment in the fisheries. In addition, data were collected on employment and compensation of those engaged in, and products of, fishery wholesale and manufacturing establishments.

Surveys were made during the year covering all coastal sections as well as the Great Lakes for 1937. Statistics of the fisheries of Alaska also were collected by the Division of Alaska Fisheries. A summary of the production of the Mississippi River and tributaries for 1931, which is the most recent year for which a survey of this section was made by the Bureau, is included in Part 2 of this report.

In addition to the above, statistics were collected on the following special phases: The landings of fish by American fishing vessels at the ports of Boston and Gloucester, Mass., Portland, Maine, and Seattle, Wash. (published monthly); catch of mackerel in the North Atlantic fishery; cold-storage holdings of frozen and cured fish and amount of fish frozen, which are furnished by the Bureau of Agricultural Economics (published monthly); production, consumption, and holdings of marine-animal oils of the United States and Alaska (published quarterly by the Bureau of the Census); production of canned fishery products and byproducts of the United States and Alaska; transactions on the sponge exchange at Tarpon Springs, Fla.; and the volume of the United States foreign trade in fishery products, furnished by the Bureau of Foreign and Domestic Commerce.

The following statistical and marketing agents assisted in the collection and compilation of the statistical data: D. Y. Aska, C. H. Chilton, L. S. Christey, S. C. Denham, F. F. Dimick, M. J. Fraser, R. L. Greer, R. L. Hacker, V. E. Heffelfinger, H. J. Kumin, B. E. Lindgren, C. H. Lyles, C. E. Peterson, C. J. Robbins, V. J. Samson, C. B. Tendick, R. T. Whiteleather, and F. M. Wood.

The reader is especially referred to the section in the latter part of this report entitled "Statistical Survey Procedure," which gives in detail the methods employed in the collection of fishery statistics and other pertinent information.

## FISHERY MARKET NEWS SERVICE

Following a period of necessary preliminary work devoted to planning, and training of personnel during the latter part of 1937, the Fishery Market News Unit of the Division was intensively engaged during 1938 in the problems connected with the opening of field offices and the issuance of daily reports therefrom. By the fall of 1938 offices were operating at four strategic points in important fish-producing and fish-marketing areas of the country, and a fifth office was issuing daily reports early in 1939.

The importance of this service to the fishery industry and allied interests is evidenced by the widespread localities and diverse classes of recipients from which requests for this service have been received. Addresses on the mailing lists include every producing and marketing area of importance in the country. Every branch of the fishing industry and numerous groups from allied fields are represented. Among the various classifications on the mailing lists are fishermen and producers; wholesale dealers; brokers; importers and exporters; buyers; retailers; chain stores; cold-storage plants; canners; salters; smokers; byproducts manufacturers; supply firms; transportation companies; Federal, State, and municipal agencies and officials; unions; associations; fishery publications; newspapers; magazines; libraries; banks; and statistical organizations.

In addition to its activities in connection with the direction and administration of the service, the Washington office of the Fishery Market News Service, in January 1939, began the preparation and dissemination of periodic current reviews of fishery market information. These are prepared in multilith form and distributed to fishermen, dealers in fish, and other interested parties. It is expected that between 10 and 15 of these reviews will be prepared each year. The need for such a service for our fishery interests has long been evident but, obviously, this need has been augmented in recent years as competition in the marketing of fishery commodities has become keener. Fortunately facilities for the preparation and dissemination of such reviews have been developed through the Fishery Market News Service. These periodic reports include summarized data, made available through the daily and monthly reports of the Fishery Market News Service, on movement, prices, and the current status of production and stocks on hand of fishery commodities; articles relating to the fisheries, prepared by members of the Bureau's staff, members of the industry, or other interested parties; excerpts or abstracts from Bureau or other publications relating to the fisheries; and related information.

During 1938 the work of the Fishery Market News Service of the Division was carried on under the immediate supervision of A. W. Anderson, Fishery Marketing Specialist, and the general direction of Fred F. Johnson, Assistant Chief of the Division. Assisting in this work, with headquarters in Washington, D. C., but working both at the headquarters office and in the field, were H. E. Timmis, Fisheries Statistical and Marketing Agent, and P. W. Evans, Junior Fisheries Marketing Agent.

### FIELD OFFICES

The locations of the field offices of the Fishery Market News Service have been carefully chosen to be not only of service to the communities near their locations but also to be of the greatest benefit to the industry as a whole. Thus, New York City was selected for the first office, since it is the center of the country's most important consuming area and the market to which fishery commodities are shipped from all parts of the Nation and from foreign countries. The fresh-water and salt-water fish markets of New York exercise considerable influence on the production and price of fishery products in many areas.

The choice of Boston for the second field office was due to its importance as the center of New England's valuable fisheries, and as a port of landing for large quantities of fresh fish. With a Market News office in Boston, and agents in nearby ports, it has been possible to include in the report data on species, quantity, price, and gear used, covering about 75 percent of the fish landed in New England each day. The catch, usually running well over 600,000,000 pounds annually, is a vital factor in the fresh and frozen fish trade of this country. The value of current detailed data to all who handle this tremendous volume of fish from fishing grounds to markets over the Eastern half of the Nation is obvious.

Chicago was selected for the third field office as the most important inland market for fishery products. Much of the harvest of fresh-water fish from the Great Lakes and other interior waters is shipped to this city's wholesale market for distribution. In addition to domestic fish, Chicago receives large quantities of Canadian fresh-water varieties. It also is a marketing area and meeting ground for Eastern haddock and rosefish, Western halibut and salmon, and Gulf Coast shrimp and red snapper, thus demonstrating the distant markets penetrated by our coastal varieties and indicating the possibilities of our inland States as fish-consuming territories.

The Seattle, Wash., office was the fourth to be established. It is at that port that the greatest quantities of halibut from the valuable Pacific Coast halibut fishery are landed. Landings of salmon for the fresh and frozen trade likewise are important. In addition the receipts and transshipments, chiefly from Alaska but also from British Columbia, of both of these species are considerable. Besides covering the local production and prices, the location of the Seattle office makes it possible to obtain similar daily information from important ports in Alaska and British Columbia. A summary of this information, together with the daily carload shipments out of Seattle and Prince Rupert, B. C., is wired to our Eastern offices, providing their local markets with the advance information of probable Western arrivals, which is so essential a factor in stabilizing market prices.

The fifth Market News office was located in Jacksonville, Fla. In contrast to the other offices Jacksonville is neither an important fishing port nor the center of a large consuming area. It is, however, a very important concentrating, distributing, and shipping center, through which most of Florida's fish passes when destined for Northern markets. From this office it not only is possible to indicate market trends in all Southern varieties of fish and shellfish by reporting the production, price, and shipments of the catch in Florida, but it also is favorably situated for obtaining data on cold-storage holdings in important plants in the South Atlantic and Gulf States, and for compiling current records of the valuable canned shrimp pack which runs over a million cases annually. Of equal importance to the Southern producers is the fact that the Jacksonville office is favorably situated to quickly disseminate wired information on receipts and prices of Southern fishery products and competitive varieties in Northern markets.

The field offices are equipped with mimeographs, folders, and addressing machines to facilitate the expeditious preparation and handling of daily reports. The return address and frank are mimeographed on the report, which is folded and sealed in such a manner that it may be mailed without the use of an envelope. Addresses are stenciled on the reports after sealing. Each office also uses a different color of paper for its reports which not only enables the recipient to quickly identify them in the mail each day but also facilitates their filing for future reference.

It is estimated that existing fishery market news offices report market conditions affecting over a billion pounds of fish and shellfish annually.

Reference is made to Figures 1 and 1a which are reproductions of the explanatory statement forwarded to those on the mailing list at the New York Fishery Market News office. Similar statements are furnished from the other offices. Figures 2, 2a, 2b, and 2c are reproductions of a representative daily report issued by the New York office.

The activities of each of the Division's Fishery Market News offices and the coverage of the daily reports emanating from them are here discussed in greater detail.

### NEW YORK, N. Y.

The New York office of the Fishery Market News Service issued its first Fishery Products Report on February 14, 1938. Reports have been released daily since then with the exception of Sundays and holidays.

The first section of each daily report includes data on the number of cars and packages of fish and shellfish which have arrived in the metropolitan area by rail freight and express during the preceding 24 hours, or, in the case of intervening Sundays or holidays, the period since the latest report. In the instance of fish, the species rarely can be indicated since it seldom is noted on the bill of lading. For shellfish, however, the species generally is shown. Following the above section of the report, arrivals by coastwise vessels are reported. Imports of fresh and frozen fish and fishery byproducts, such as fish oils, fish meals, etc., are compiled daily from the ship's manifests filed at the local Customhouse, and information concerning the commodity, number of packages, country from which shipped, and the name of the vessel are shown in the daily report.

Direct landings by fishing vessels at the New York market are reported as "hailing fares." Since hailing fares often vary from the actual landings, the exact "weigh-outs" are included in the report for the following day. With the advent of the Fishery Market News Report an accurate record of landings by species at New York City has been made available for the first time.

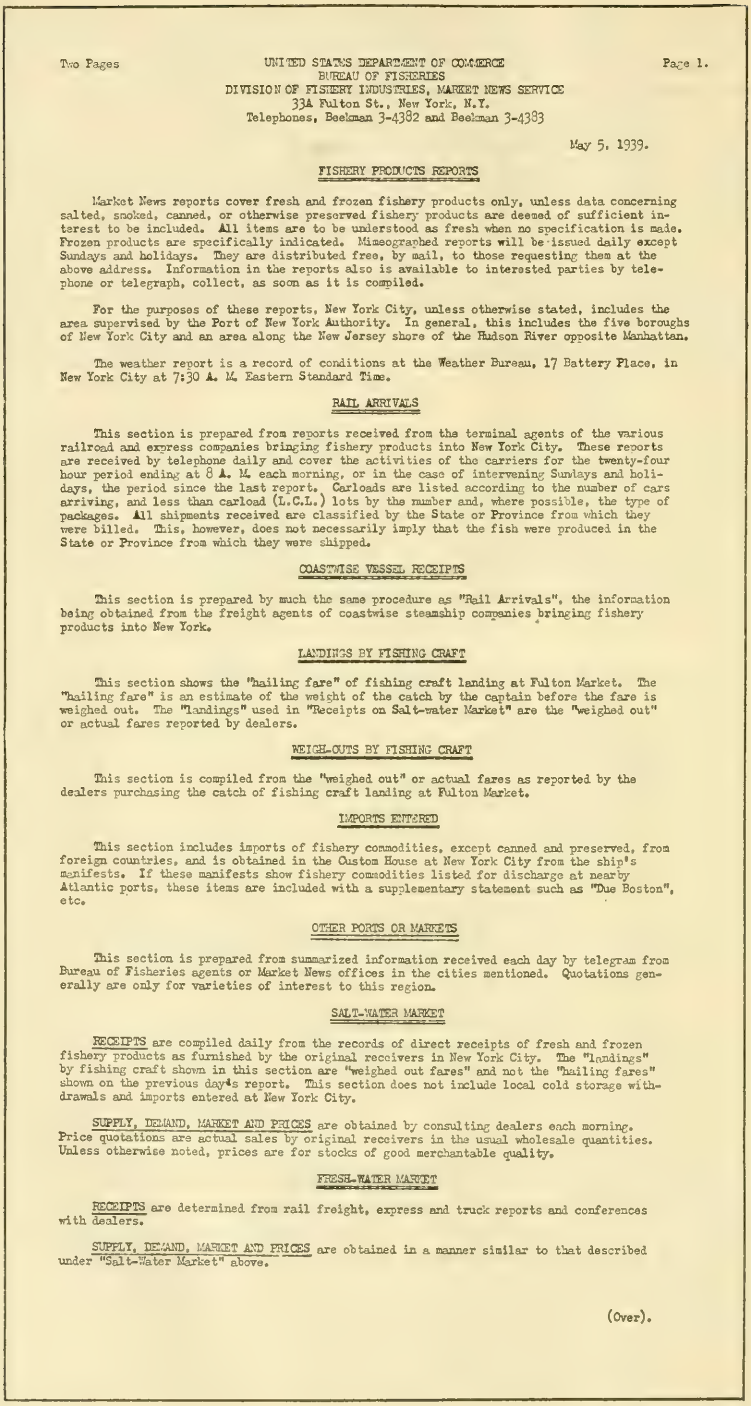
Landings by fishing craft at Portland and Rockland, Maine, and at Boston, Gloucester, Provincetown, and New Bedford, Mass., are tabulated and included in the report. The number of craft, type of gear used, and the price of each species landed also are shown. Sections on Pacific coast markets include the transactions on the halibut and salmon exchanges in Seattle, Wash., halibut landings at Prince Rupert, B. C., and the number of cars of fresh or frozen fish shipped East from each of these ports. Such information relating to market conditions at other fishing ports is received in New York by telegraph early each morning.

The amount of fish and shellfish entering or withdrawn from cold-storage plants in the Greater New York area is compiled and shown daily in about 60 classifications. Once each week the current holdings are compared with the holdings of the preceding week and also with the holdings for 4 weeks and 1 year previous. Ten cold-storage firms with 14 plants have cooperated with the Bureau in furnishing these data. Of these plants only two actually freeze fish or shellfish, while the rest are storage plants and receive their goods already frozen.

As the salt-water market is separate from the fresh-water market, the prices for the two are included in different sections of the report. Managers and salesmen of the various firms are interviewed daily to obtain the day's wholesale price quotations for the various kinds of fish and shellfish. Prices usually are accompanied by essential qualifying descriptions of the commodity, such as size and quality of the product, locality of capture, gear used, and size and type of package.

At the same time that quotations are being gathered in the salt-water market, a record of the receipts of each firm is obtained. These are compiled and, on the following day, these records furnish the basis for the section of the report showing the total quantity of each species received by States and Canadian Provinces. The record of the receipts of each firm also shows the method of transportation into the market area. In 1939 a summary making use of this information will be compiled for the salt-water market. This summary will classify receipts by origin and by method of transportation, such as truck, express, rail freight, coastwise vessel, and fishing craft.

For the 6 months from March through August 1938, the salt-water market received 79,686,000 pounds of fish; excluding imports and receipts of filleters and some hotel-supply houses. Receipts of shellfish, 22 species in all, are not included in the above figure. The largest poundage arrived by motortruck, accounting for 40 percent of the total. Fishing craft landings were next with 27 percent. Rail freight and rail express followed, with 23 percent and 9 percent, respectively. Coastwise vessels carried only one-half of 1 percent of the total. Seventy-six different species of fish were received.



Two Pages UNITED STATES DEPARTMENT OF COMMERCE Page 1.

BUREAU OF FISHERIES
DIVISION OF FISHERY INDUSTRIES, MARKET NEWS SERVICE
33A Fulton St., New York, N.Y.
Telephones, Beekman 3-4382 and Beekman 3-4383

May 5, 1939.

FISHERY PRODUCTS REPORTS

Market News reports cover fresh and frozen fishery products only, unless data concerning salted, smoked, canned, or otherwise preserved fishery products are deemed of sufficient interest to be included. All items are to be understood as fresh when no specification is made. Frozen products are specifically indicated. Mimeographed reports will be issued daily except Sundays and holidays. They are distributed free, by mail, to those requesting them at the above address. Information in the reports also is available to interested parties by telephone or telegraph, collect, as soon as it is compiled.

For the purposes of these reports, New York City, unless otherwise stated, includes the area supervised by the Port of New York Authority. In general, this includes the five boroughs of New York City and an area along the New Jersey shore of the Hudson River opposite Manhattan.

The weather report is a record of conditions at the Weather Bureau, 17 Battery Place, in New York City at 7:30 A. M. Eastern Standard Time.

RAIL ARRIVALS

This section is prepared from reports received from the terminal agents of the various railroad and express companies bringing fishery products into New York City. These reports are received by telephone daily and cover the activities of the carriers for the twenty-four hour period ending at 8 A. M. each morning, or in the case of intervening Sundays and holidays, the period since the last report. Carloads are listed according to the number of cars arriving, and less than carload (L.C.L.) lots by the number and, where possible, the type of packages. All shipments received are classified by the State or Province from which they were billed. This, however, does not necessarily imply that the fish were produced in the State or Province from which they were shipped.

COASTWISE VESSEL RECEIPTS

This section is prepared by much the same procedure as "Rail Arrivals", the information being obtained from the freight agents of coastwise steamship companies bringing fishery products into New York.

LANDINGS BY FISHING CRAFT

This section shows the "hailing fare" of fishing craft landing at Fulton Market. The "hailing fare" is an estimate of the weight of the catch by the captain before the fare is weighed out. The "landings" used in "Receipts on Salt-water Market" are the "weighed out" or actual fares reported by dealers.

WEIGH-OUTS BY FISHING CRAFT

This section is compiled from the "weighed out" or actual fares as reported by the dealers purchasing the catch of fishing craft landing at Fulton Market.

IMPORTS ENTERED

This section includes imports of fishery commodities, except canned and preserved, from foreign countries, and is obtained in the Custom House at New York City from the ship's manifests. If these manifests show fishery commodities listed for discharge at nearby Atlantic ports, these items are included with a supplementary statement such as "Due Boston", etc.

OTHER PORTS OR MARKETS

This section is prepared from summarized information received each day by telegram from Bureau of Fisheries agents or Market News offices in the cities mentioned. Quotations generally are only for varieties of interest to this region.

SALT-WATER MARKET

RECEIPTS are compiled daily from the records of direct receipts of fresh and frozen fishery products as furnished by the original receivers in New York City. The "landings" by fishing craft shown in this section are "weighed out fares" and not the "hailing fares" shown on the previous day's report. This section does not include local cold storage withdrawals and imports entered at New York City.

SUPPLY, DEMAND, MARKET AND PRICES are obtained by consulting dealers each morning. Price quotations are actual sales by original receivers in the usual wholesale quantities. Unless otherwise noted, prices are for stocks of good merchantable quality.

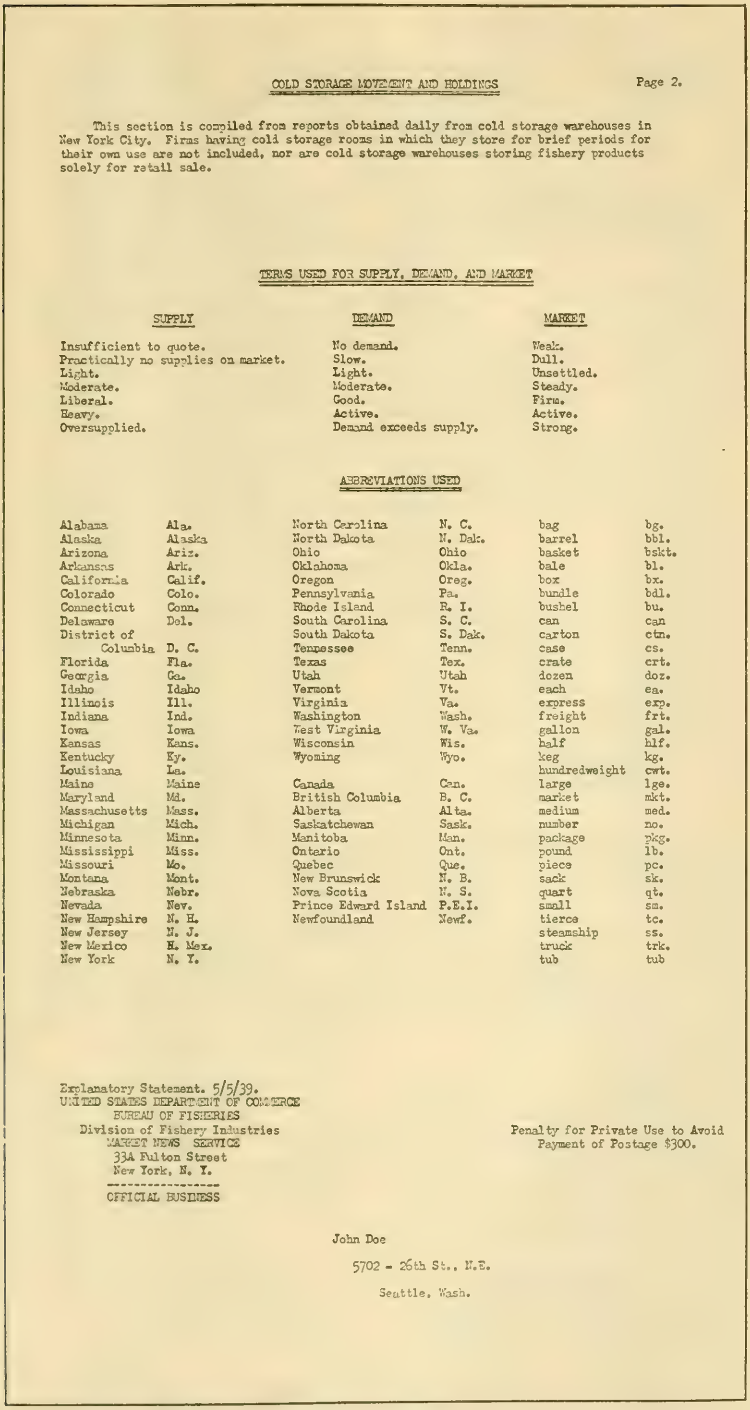
FRESH-WATER MARKET

RECEIPTS are determined from rail freight, express and truck reports and conferences with dealers.

SUPPLY, DEMAND, MARKET AND PRICES are obtained in a manner similar to that described under "Salt-Water Market" above.

(Over).

FIGURE 1.—Reproduction of page 1 of a typical explanatory statement concerning Fishery Market News Service reports.



COLD STORAGE MOVEMENT AND HOLDINGS Page 2.

This section is compiled from reports obtained daily from cold storage warehouses in New York City. Firms having cold storage rooms in which they store for brief periods for their own use are not included, nor are cold storage warehouses storing fishery products solely for retail sale.

TERMS USED FOR SUPPLY, DEMAND, AND MARKET

| SUPPLY | DEMAND | MARKET |
|---|---|---|
| Insufficient to quote. | No demand. | Weak. |
| Practically no supplies on market. | Slow. | Dull. |
| Light. | Light. | Unsettled. |
| Moderate. | Moderate. | Steady. |
| Liberal. | Good. | Firm. |
| Heavy. | Active. | Active. |
| Oversupplied. | Demand exceeds supply. | Strong. |

ABBREVIATIONS USED

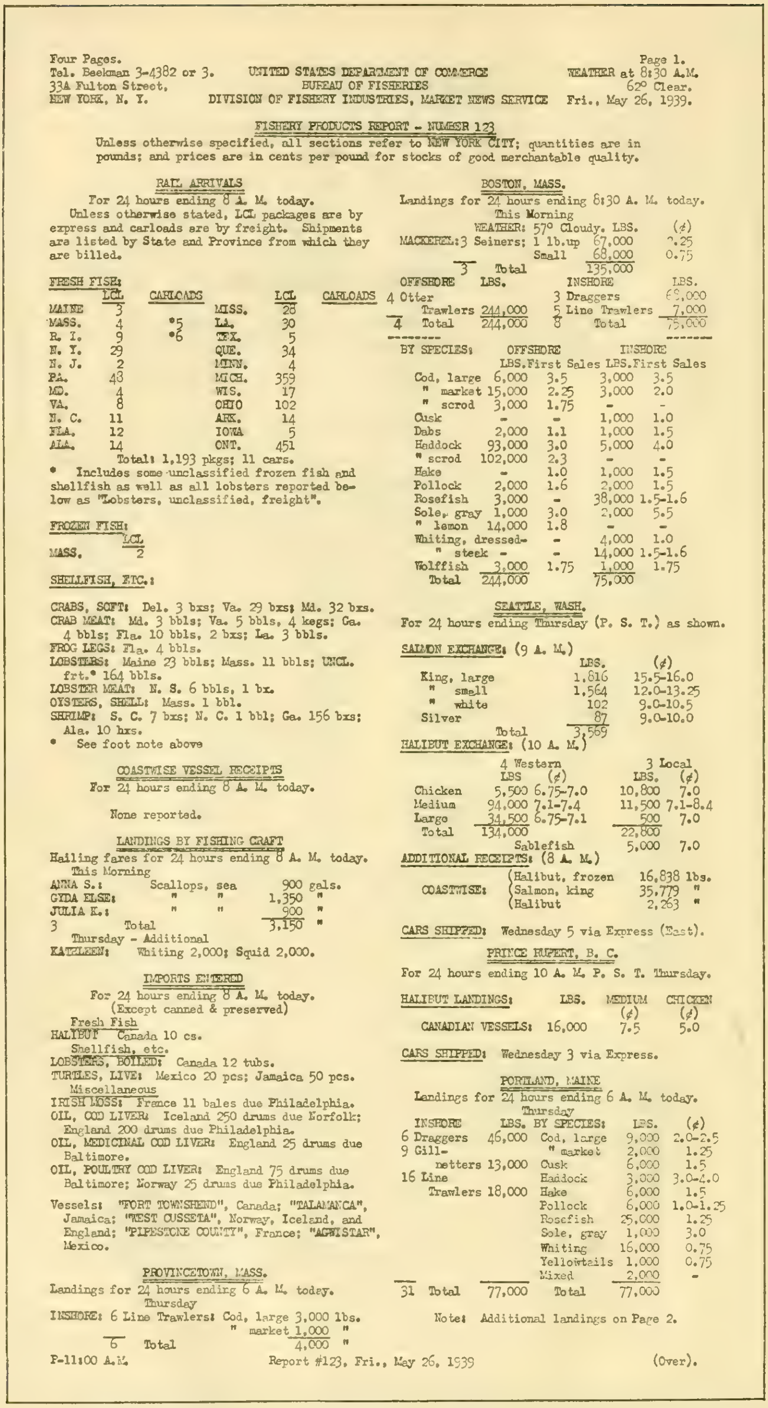
| | | | | | |
|---|---|---|---|---|---|
| Alabama | Ala. | North Carolina | N. C. | bag | bg. |
| Alaska | Alaska | North Dakota | N. Dak. | barrel | bbl. |
| Arizona | Ariz. | Ohio | Ohio | basket | bskt. |
| Arkansas | Ark. | Oklahoma | Okla. | bale | bl. |
| California | Calif. | Oregon | Oreg. | box | bx. |
| Colorado | Colo. | Pennsylvania | Pa. | bundle | bdl. |
| Connecticut | Conn. | Rhode Island | R. I. | bushel | bu. |
| Delaware | Del. | South Carolina | S. C. | can | can |
| District of Columbia | D. C. | South Dakota | S. Dak. | carton | ctn. |
| Florida | Fla. | Tennessee | Tenn. | case | cs. |
| Georgia | Ga. | Texas | Tex. | crate | crt. |
| Idaho | Idaho | Utah | Utah | dozen | doz. |
| Illinois | Ill. | Vermont | Vt. | each | ea. |
| Indiana | Ind. | Virginia | Va. | express | exp. |
| Iowa | Iowa | Washington | Wash. | freight | frt. |
| Kansas | Kans. | West Virginia | W. Va. | gallon | gal. |
| Kentucky | Ky. | Wisconsin | Wis. | half | hlf. |
| Louisiana | La. | Wyoming | Wyo. | keg | kg. |
| Maine | Maine | | | hundredweight | cwt. |
| Maryland | Md. | Canada | Can. | large | lge. |
| Massachusetts | Mass. | British Columbia | B. C. | market | mkt. |
| Michigan | Mich. | Alberta | Alta. | medium | med. |
| Minnesota | Minn. | Saskatchewan | Sask. | number | no. |
| Mississippi | Miss. | Manitoba | Man. | package | pkg. |
| Missouri | Mo. | Ontario | Ont. | pound | lb. |
| Montana | Mont. | Quebec | Que. | piece | pc. |
| Nebraska | Nebr. | New Brunswick | N. B. | sack | sk. |
| Nevada | Nev. | Nova Scotia | N. S. | quart | qt. |
| New Hampshire | N. H. | Prince Edward Island | P.E.I. | small | sm. |
| New Jersey | N. J. | Newfoundland | Newf. | tierce | tc. |
| New Mexico | N. Mex. | | | steamship | ss. |
| New York | N. Y. | | | truck | trk. |
| | | | | tub | tub |

Explanatory Statement. 5/5/39.
UNITED STATES DEPARTMENT OF COMMERCE
BUREAU OF FISHERIES
Division of Fishery Industries
MARKET NEWS SERVICE
33A Fulton Street
New York, N. Y.
----------------
OFFICIAL BUSINESS

Penalty for Private Use to Avoid Payment of Postage $300.

John Doe
5702 - 26th St., N.E.
Seattle, Wash.

FIGURE 1a.—Reproduction of page 2 of the statement shown on the preceding page.



Four Pages. Page 1.
Tel. Beekman 3-4382 or 3. UNITED STATES DEPARTMENT OF COMMERCE WEATHER at 8:30 A.M.
33A Fulton Street, BUREAU OF FISHERIES 62° Clear.
NEW YORK, N. Y. DIVISION OF FISHERY INDUSTRIES, MARKET NEWS SERVICE Fri., May 26, 1939.

FISHERY PRODUCTS REPORT - NUMBER 123

Unless otherwise specified, all sections refer to NEW YORK CITY; quantities are in pounds; and prices are in cents per pound for stocks of good merchantable quality.

RAIL ARRIVALS

For 24 hours ending 8 A. M. today.

Unless otherwise stated, LCL packages are by express and carloads are by freight. Shipments are listed by State and Province from which they are billed.

FRESH FISH:

| | LCL | CARLOADS | | LCL | CARLOADS |
|---|---|---|---|---|---|
| MAINE | 3 | | MISS. | 28 | |
| MASS. | 4 | •5 | LA. | 30 | |
| R. I. | 9 | •6 | TEX. | 5 | |
| N. Y. | 29 | | QUE. | 34 | |
| N. J. | 2 | | MINN. | 4 | |
| PA. | 43 | | MICH. | 359 | |
| MD. | 4 | | WIS. | 17 | |
| VA. | 8 | | OHIO | 102 | |
| N. C. | 11 | | ARK. | 14 | |
| FLA. | 12 | | IOWA | 5 | |
| ALA. | 14 | | ONT. | 451 | |

Total: 1,193 pkgs; 11 cars.

• Includes some unclassified frozen fish and shellfish as well as all lobsters reported below as "Lobsters, unclassified, freight".

FROZEN FISH:

| | LCL |
|---|---|
| MASS. | 2 |

SHELLFISH, ETC.:

CRABS, SOFT: Del. 3 bxs; Va. 29 bxs; Md. 32 bxs.
CRAB MEAT: Md. 3 bbls; Va. 5 bbls, 4 kegs; Ga. 4 bbls; Fla. 10 bbls, 2 bxs; La. 3 bbls.
FROG LEGS: Fla. 4 bbls.
LOBSTERS: Maine 23 bbls; Mass. 11 bbls; UNCL. frt.• 164 bbls.
LOBSTER MEAT: N. S. 6 bbls, 1 bx.
OYSTERS, SHELL: Mass. 1 bbl.
SHRIMP: S. C. 7 bxs; N. C. 1 bbl; Ga. 156 bxs; Ala. 10 bxs.
• See foot note above

COASTWISE VESSEL RECEIPTS

For 24 hours ending 8 A. M. today.

None reported.

LANDINGS BY FISHING CRAFT

Hailing fares for 24 hours ending 8 A. M. today.

This Morning

| | | | |
|---|---|---|---|
| ANNA S.: | Scallops, sea | 900 | gals. |
| GYDA ELSE: | " " | 1,350 | " |
| JULIA K.: | " " | 900 | " |
| 3 | Total | 3,150 | " |

Thursday - Additional
KATHLEEN: Whiting 2,000; Squid 2,000.

IMPORTS ENTERED

For 24 hours ending 8 A. M. today.
(Except canned & preserved)

Fresh Fish
HALIBUT Canada 10 cs.

Shellfish, etc.
LOBSTERS, BOILED: Canada 12 tubs.
TURTLES, LIVE: Mexico 20 pcs; Jamaica 50 pcs.

Miscellaneous
IRISH MOSS: France 11 bales due Philadelphia.
OIL, COD LIVER: Iceland 250 drums due Norfolk; England 200 drums due Philadelphia.
OIL, MEDICINAL COD LIVER: England 25 drums due Baltimore.
OIL, POULTRY COD LIVER: England 75 drums due Baltimore; Norway 25 drums due Philadelphia.

Vessels: "FORT TOWNSHEND", Canada; "TALAMANCA", Jamaica; "WEST CUSSETA", Norway, Iceland, and England; "PIPESTONE COUNTY", France; "AGWISTAR", Mexico.

PROVINCETOWN, MASS.

Landings for 24 hours ending 6 A. M. today.

Thursday

| | | | |
|---|---|---|---|
| INSHORE: 6 Line Trawlers: | Cod, large | 3,000 | lbs. |
| | " market | 1,000 | " |
| 6 Total | | 4,000 | " |

BOSTON, MASS.

Landings for 24 hours ending 8:30 A. M. today.

This Morning

WEATHER: 57° Cloudy.

| | | LBS. | (¢) |
|---|---|---|---|
| MACKEREL: 3 Seiners; | 1 lb.up | 67,000 | 2.25 |
| | Small | 68,000 | 0.75 |
| 3 | Total | 135,000 | |

| OFFSHORE | LBS. | INSHORE | LBS. |
|---|---|---|---|
| 4 Otter Trawlers | 244,000 | 3 Draggers | 68,000 |
| | | 5 Line Trawlers | 7,000 |
| 4 Total | 244,000 | 8 Total | 75,000 |

| BY SPECIES: | OFFSHORE LBS. | OFFSHORE First Sales | INSHORE LBS. | INSHORE First Sales |
|---|---|---|---|---|
| Cod, large | 6,000 | 3.5 | 3,000 | 3.5 |
| " market | 15,000 | 2.25 | 3,000 | 2.0 |
| " scrod | 3,000 | 1.75 | - | - |
| Cusk | - | - | 1,000 | 1.0 |
| Dabs | 2,000 | 1.1 | 1,000 | 1.5 |
| Haddock | 93,000 | 3.0 | 5,000 | 4.0 |
| " scrod | 102,000 | 2.3 | - | - |
| Hake | - | 1.0 | 1,000 | 1.5 |
| Pollock | 2,000 | 1.6 | 2,000 | 1.5 |
| Rosefish | 3,000 | - | 38,000 | 1.5-1.6 |
| Sole, gray | 1,000 | 3.0 | 2,000 | 5.5 |
| " lemon | 14,000 | 1.8 | - | - |
| Whiting, dressed | - | - | 4,000 | 1.0 |
| " steak | - | - | 14,000 | 1.5-1.6 |
| Wolffish | 3,000 | 1.75 | 1,000 | 1.75 |
| Total | 244,000 | | 75,000 | |

SEATTLE, WASH.

For 24 hours ending Thursday (P. S. T.) as shown.

SALMON EXCHANGE: (9 A. M.)

| | LBS. | (¢) |
|---|---|---|
| King, large | 1,816 | 15.5-16.0 |
| " small | 1,564 | 12.0-13.25 |
| " white | 102 | 9.0-10.5 |
| Silver | 87 | 9.0-10.0 |
| Total | 3,569 | |

HALIBUT EXCHANGE: (10 A. M.)

| | 4 Western LBS | 4 Western (¢) | 3 Local LBS. | 3 Local (¢) |
|---|---|---|---|---|
| Chicken | 5,500 | 6.75-7.0 | 10,800 | 7.0 |
| Medium | 94,000 | 7.1-7.4 | 11,500 | 7.1-8.4 |
| Large | 34,500 | 6.75-7.1 | 500 | 7.0 |
| Total | 134,000 | | 22,800 | |
| Sablefish | | | 5,000 | 7.0 |

ADDITIONAL RECEIPTS: (8 A. M.)

| | | | |
|---|---|---|---|
| COASTWISE: | Halibut, frozen | 16,838 | lbs. |
| | Salmon, king | 35,779 | " |
| | Halibut | 2,263 | " |

CARS SHIPPED: Wednesday 5 via Express (East).

PRINCE RUPERT, B. C.

For 24 hours ending 10 A. M. P. S. T. Thursday.

| HALIBUT LANDINGS: | LBS. | MEDIUM (¢) | CHICKEN (¢) |
|---|---|---|---|
| CANADIAN VESSELS: | 16,000 | 7.5 | 5.0 |

CARS SHIPPED: Wednesday 3 via Express.

PORTLAND, MAINE

Landings for 24 hours ending 6 A. M. today.

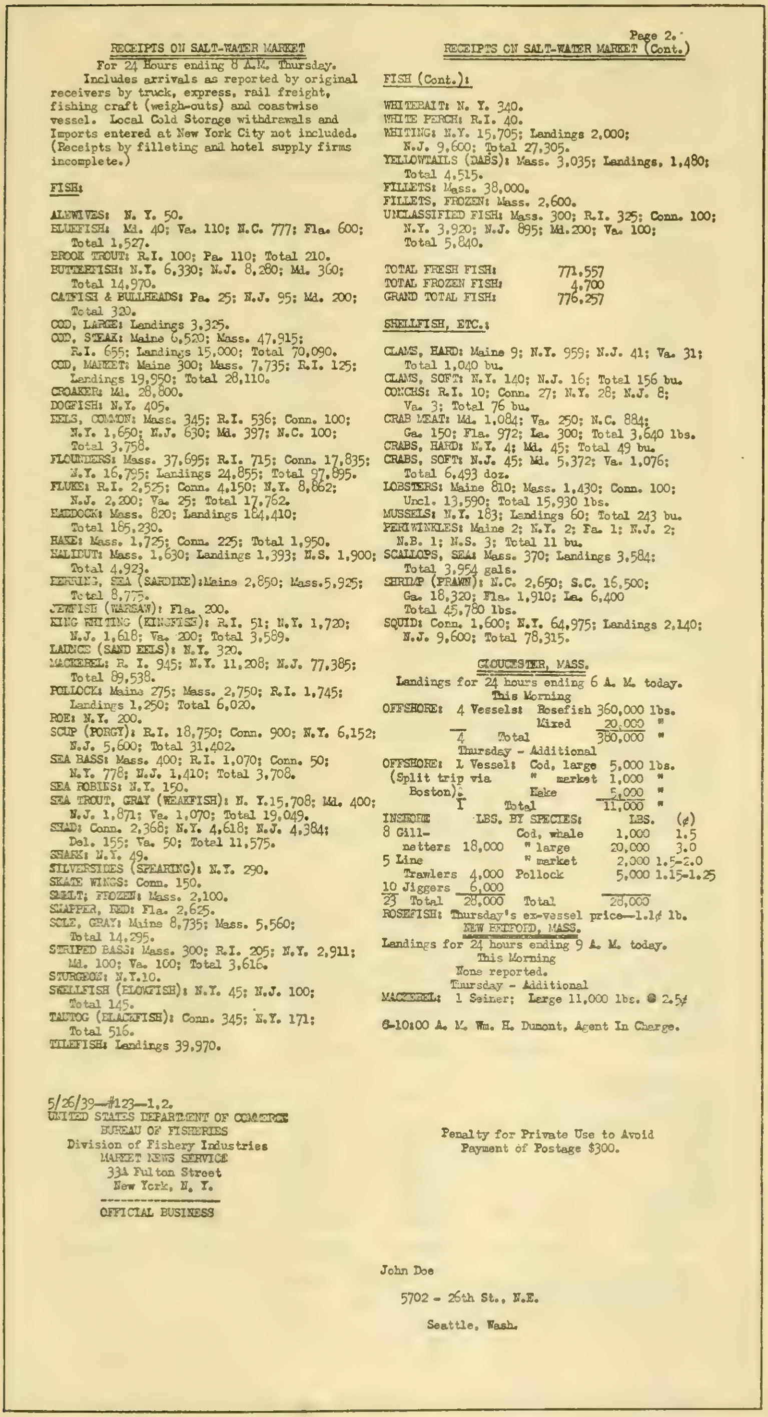
Thursday

| INSHORE | LBS. | BY SPECIES: | LBS. | (¢) |
|---|---|---|---|---|
| 6 Draggers | 46,000 | Cod, large | 9,000 | 2.0-2.5 |
| 9 Gill-netters | 13,000 | " market | 2,000 | 1.25 |
| | | Cusk | 6,000 | 1.5 |
| 16 Line Trawlers | 18,000 | Haddock | 3,000 | 3.0-4.0 |
| | | Hake | 6,000 | 1.5 |
| | | Pollock | 6,000 | 1.0-1.25 |
| | | Rosefish | 25,000 | 1.25 |
| | | Sole, gray | 1,000 | 3.0 |
| | | Whiting | 16,000 | 0.75 |
| | | Yellowtails | 1,000 | 0.75 |
| | | Mixed | 2,000 | - |
| 31 Total | 77,000 | Total | 77,000 | |

Note: Additional landings on Page 2.

P-11:00 A.M. Report #123, Fri., May 26, 1939 (Over).

FIGURE 2.—Reproduction of page 1 of a typical daily Fishery Market News Service report issued by the New York City office.



RECEIPTS ON SALT-WATER MARKET

For 24 Hours ending 8 A.M. Thursday.

Includes arrivals as reported by original receivers by truck, express, rail freight, fishing craft (weigh-outs) and coastwise vessel. Local Cold Storage withdrawals and Imports entered at New York City not included. (Receipts by filleting and hotel supply firms incomplete.)

FISH:

ALEWIVES: N. Y. 50.
BLUEFISH: Md. 40; Va. 110; N.C. 777; Fla. 600; Total 1,527.
BROOK TROUT: R.I. 100; Pa. 110; Total 210.
BUTTERFISH: N.Y. 6,330; N.J. 8,280; Md. 360; Total 14,970.
CATFISH & BULLHEADS: Pa. 25; N.J. 95; Md. 200; Total 320.
COD, LARGE: Landings 3,325.
COD, STEAK: Maine 6,520; Mass. 47,915; R.I. 655; Landings 15,000; Total 70,090.
COD, MARKET: Maine 300; Mass. 7,735; R.I. 125; Landings 19,950; Total 28,110.
CROAKER: Md. 28,800.
DOGFISH: N.Y. 405.
EELS, COMMON: Mass. 345; R.I. 536; Conn. 100; N.Y. 1,650; N.J. 630; Md. 397; N.C. 100; Total 3,758.
FLOUNDERS: Mass. 37,695; R.I. 715; Conn. 17,835; N.Y. 16,795; Landings 24,855; Total 97,895.
FLUKE: R.I. 2,525; Conn. 4,150; N.Y. 8,862; N.J. 2,200; Va. 25; Total 17,762.
HADDOCK: Mass. 820; Landings 184,410; Total 185,230.
HAKE: Mass. 1,725; Conn. 225; Total 1,950.
HALIBUT: Mass. 1,630; Landings 1,393; N.S. 1,900; Total 4,923.
HERRING, SEA (SARDINE): Maine 2,850; Mass. 5,925; Total 8,775.
JEWFISH (WARSAW): Fla. 200.
KING WHITING (KINGFISH): R.I. 51; N.Y. 1,720; N.J. 1,618; Va. 200; Total 3,589.
LAUNCE (SAND EELS): N.Y. 320.
MACKEREL: R. I. 945; N.Y. 11,208; N.J. 77,385; Total 89,538.
POLLOCK: Maine 275; Mass. 2,750; R.I. 1,745; Landings 1,250; Total 6,020.
ROE: N.Y. 200.
SCUP (PORGY): R.I. 18,750; Conn. 900; N.Y. 6,152; N.J. 5,600; Total 31,402.
SEA BASS: Mass. 400; R.I. 1,070; Conn. 50; N.Y. 778; N.J. 1,410; Total 3,708.
SEA ROBINS: N.Y. 150.
SEA TROUT, GRAY (WEAKFISH): N. Y. 15,708; Md. 400; N.J. 1,871; Va. 1,070; Total 19,049.
SHAD: Conn. 2,368; N.Y. 4,618; N.J. 4,384; Del. 155; Va. 50; Total 11,575.
SHARK: N.Y. 49.
SILVERSIDES (SPEARING): N.Y. 290.
SKATE WINGS: Conn. 150.
SMELT; FROZEN: Mass. 2,100.
SNAPPER, RED: Fla. 2,625.
SOLE, GRAY: Maine 8,735; Mass. 5,560; Total 14,295.
STRIPED BASS: Mass. 300; R.I. 205; N.Y. 2,911; Md. 100; Va. 100; Total 3,616.
STURGEON: N.Y. 10.
SWELLFISH (BLOWFISH): N.Y. 45; N.J. 100; Total 145.
TAUTOG (BLACKFISH): Conn. 345; N.Y. 171; Total 516.
TILEFISH: Landings 39,970.

5/26/39—#123—1,2.
UNITED STATES DEPARTMENT OF COMMERCE
BUREAU OF FISHERIES
Division of Fishery Industries
MARKET NEWS SERVICE
334 Fulton Street
New York, N. Y.

OFFICIAL BUSINESS

Page 2.

RECEIPTS ON SALT-WATER MARKET (Cont.)

FISH (Cont.):

WHITEBAIT: N. Y. 340.
WHITE PERCH: R.I. 40.
WHITING: N.Y. 15,705; Landings 2,000; N.J. 9,600; Total 27,305.
YELLOWTAILS (DABS): Mass. 3,035; Landings, 1,480; Total 4,515.
FILLETS: Mass. 38,000.
FILLETS, FROZEN: Mass. 2,600.
UNCLASSIFIED FISH: Mass. 300; R.I. 325; Conn. 100; N.Y. 3,920; N.J. 895; Md. 200; Va. 100; Total 5,840.

| | |
|---|---|
| TOTAL FRESH FISH: | 771,557 |
| TOTAL FROZEN FISH: | 4,700 |
| GRAND TOTAL FISH: | 776,257 |

SHELLFISH, ETC.:

CLAMS, HARD: Maine 9; N.Y. 959; N.J. 41; Va. 31; Total 1,040 bu.
CLAMS, SOFT: N.Y. 140; N.J. 16; Total 156 bu.
CONCHS: R.I. 10; Conn. 27; N.Y. 28; N.J. 8; Va. 3; Total 76 bu.
CRAB MEAT: Md. 1,084; Va. 250; N.C. 884; Ga. 150; Fla. 972; La. 300; Total 3,640 lbs.
CRABS, HARD: N.Y. 4; Md. 45; Total 49 bu.
CRABS, SOFT: N.J. 45; Md. 5,372; Va. 1,076; Total 6,493 doz.
LOBSTERS: Maine 810; Mass. 1,430; Conn. 100; Uncl. 13,590; Total 15,930 lbs.
MUSSELS: N.Y. 183; Landings 60; Total 243 bu.
PERIWINKLES: Maine 2; N.Y. 2; Pa. 1; N.J. 2; N.B. 1; N.S. 3; Total 11 bu.
SCALLOPS, SEA: Mass. 370; Landings 3,584; Total 3,954 gals.
SHRIMP (PRAWN): N.C. 2,650; S.C. 16,500; Ga. 18,320; Fla. 1,910; La. 6,400 Total 45,780 lbs.
SQUID: Conn. 1,600; N.Y. 64,975; Landings 2,140; N.J. 9,600; Total 78,315.

GLOUCESTER, MASS.

Landings for 24 hours ending 6 A. M. today.

This Morning

| | | | |
|---|---|---|---|
| OFFSHORE: | 4 Vessels: | Rosefish | 360,000 lbs. |
| | | Mixed | 20,000 " |
| | 4 | Total | 380,000 " |

Thursday - Additional

| | | | |
|---|---|---|---|
| OFFSHORE: | 1 Vessel: | Cod, large | 5,000 lbs. |
| (Split trip via | | " market | 1,000 " |
| Boston): | | Hake | 5,000 " |
| | 1 | Total | 11,000 " |

| INSHORE | LBS. | BY SPECIES: | LBS. | (¢) |
|---|---|---|---|---|
| 8 Gill- | | Cod, whale | 1,000 | 1.5 |
| netters | 18,000 | " large | 20,000 | 3.0 |
| 5 Line | | " market | 2,000 | 1.5-2.0 |
| Trawlers | 4,000 | Pollock | 5,000 | 1.15-1.25 |
| 10 Jiggers | 6,000 | | | |
| 23 Total | 28,000 | Total | 28,000 | |

ROSEFISH: Thursday's ex-vessel price—1.1¢ lb.

NEW BEDFORD, MASS.

Landings for 24 hours ending 9 A. M. today.

This Morning

None reported.

Thursday - Additional

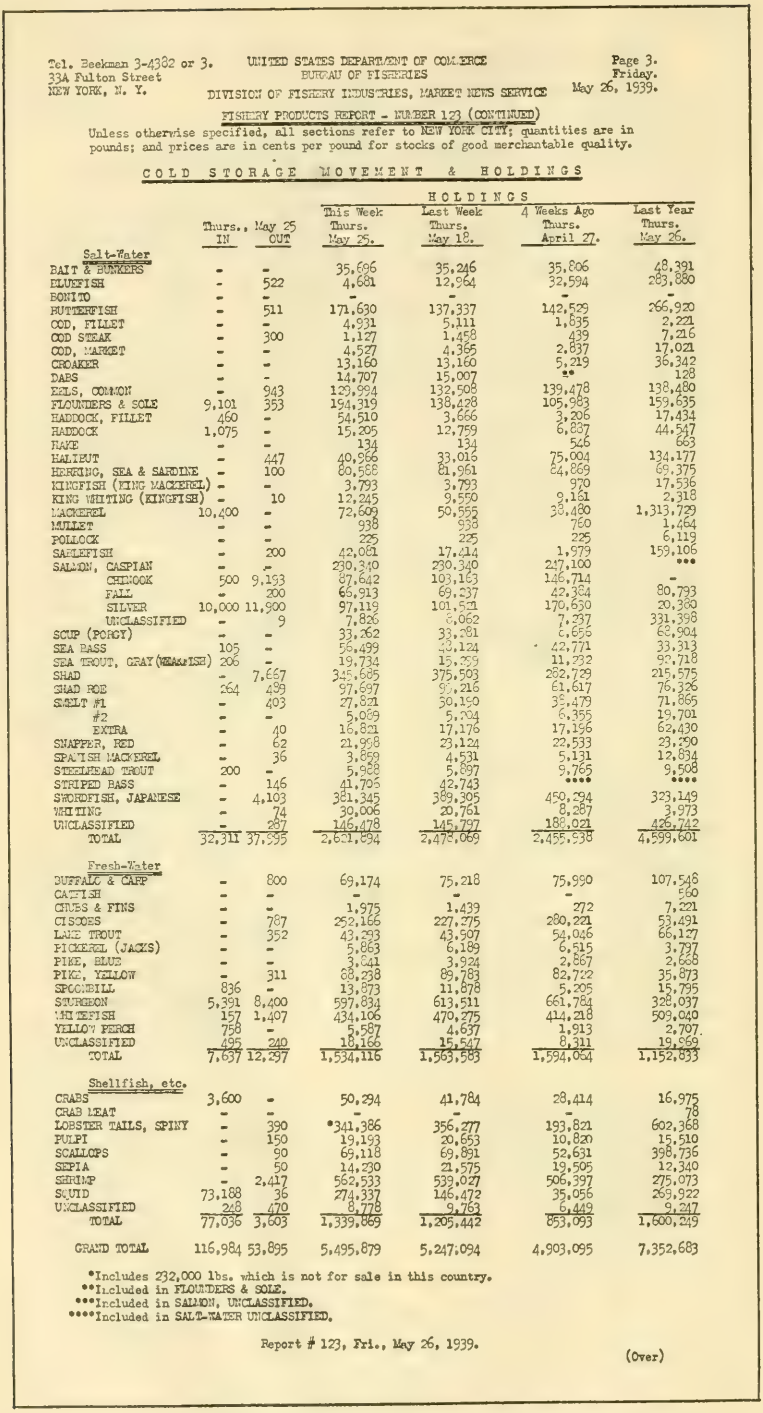
MACKEREL: 1 Seiner; Large 11,000 lbs. @ 2.5¢

6-10:00 A. M. Wm. H. Dumont, Agent In Charge.

Penalty for Private Use to Avoid Payment of Postage $300.

John Doe
5702 - 26th St., N.E.
Seattle, Wash.

FIGURE 2a.—Reproduction of page 2 of the report shown on the preceding page.



Tel. Beekman 3-4382 or 3.
33A Fulton Street
NEW YORK, N. Y.

UNITED STATES DEPARTMENT OF COMMERCE
BUREAU OF FISHERIES
DIVISION OF FISHERY INDUSTRIES, MARKET NEWS SERVICE

Page 3.
Friday.
May 26, 1939.

FISHERY PRODUCTS REPORT - NUMBER 123 (CONTINUED)

Unless otherwise specified, all sections refer to NEW YORK CITY; quantities are in pounds; and prices are in cents per pound for stocks of good merchantable quality.

COLD STORAGE MOVEMENT & HOLDINGS

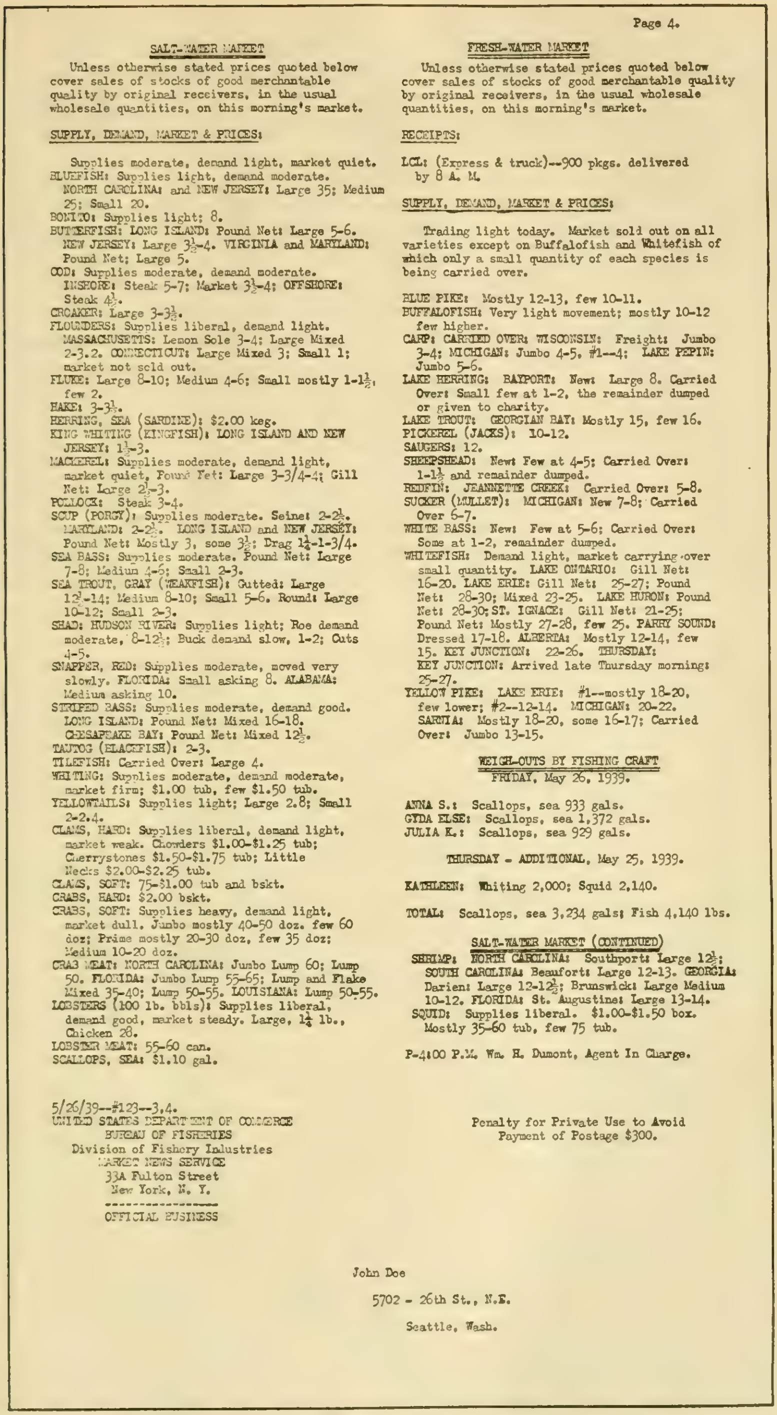
| | Thurs., May 25 | | HOLDINGS | | | |
|---|---|---|---|---|---|---|
| | IN | OUT | This Week Thurs. May 25. | Last Week Thurs. May 18. | 4 Weeks Ago Thurs. April 27. | Last Year Thurs. May 26. |
| Salt-Water | | | | | | |
| BAIT & BUNKERS | - | - | 35,696 | 35,246 | 35,806 | 48,391 |
| BLUEFISH | - | 522 | 4,681 | 12,964 | 32,594 | 283,880 |
| BONITO | - | - | - | - | - | - |
| BUTTERFISH | - | 511 | 171,630 | 137,337 | 142,529 | 266,920 |
| COD, FILLET | - | - | 4,931 | 5,111 | 1,835 | 2,221 |
| COD STEAK | - | 300 | 1,127 | 1,458 | 439 | 7,216 |
| COD, MARKET | - | - | 4,527 | 4,365 | 2,837 | 17,021 |
| CROAKER | - | - | 13,160 | 13,160 | 5,219 | 36,342 |
| DABS | - | - | 14,707 | 15,007 | ** | 128 |
| EELS, COMMON | - | 943 | 129,994 | 132,508 | 139,478 | 138,480 |
| FLOUNDERS & SOLE | 9,101 | 353 | 194,319 | 138,428 | 105,983 | 159,635 |
| HADDOCK, FILLET | 460 | - | 54,510 | 3,666 | 3,206 | 17,434 |
| HADDOCK | 1,075 | - | 15,205 | 12,759 | 6,837 | 44,547 |
| HAKE | - | - | 134 | 134 | 546 | 663 |
| HALIBUT | - | 447 | 40,966 | 33,016 | 75,004 | 134,177 |
| HERRING, SEA & SARDINE | - | 100 | 80,588 | 81,961 | 84,869 | 69,375 |
| KINGFISH (KING MACKEREL) | - | - | 3,793 | 3,793 | 970 | 17,536 |
| KING WHITING (KINGFISH) | - | 10 | 12,245 | 9,550 | 9,161 | 2,318 |
| MACKEREL | 10,400 | - | 72,609 | 50,555 | 38,480 | 1,313,729 |
| MULLET | - | - | 938 | 938 | 760 | 1,464 |
| POLLOCK | - | - | 225 | 225 | 225 | 6,119 |
| SABLEFISH | - | 200 | 42,081 | 17,414 | 1,979 | 159,106 |
| SALMON, CASPIAN | - | - | 230,340 | 230,340 | 247,100 | *** |
| CHINOOK | 500 | 9,193 | 87,642 | 103,163 | 146,714 | - |
| FALL | - | 200 | 66,913 | 69,237 | 42,384 | 80,793 |
| SILVER | 10,000 | 11,900 | 97,119 | 101,521 | 170,630 | 20,380 |
| UNCLASSIFIED | - | 9 | 7,826 | 8,062 | 7,237 | 331,398 |
| SCUP (PORGY) | - | - | 33,262 | 33,281 | 6,656 | 68,904 |
| SEA BASS | 105 | - | 56,499 | 43,124 | 42,771 | 33,313 |
| SEA TROUT, GRAY (WEAKFISH) | 206 | - | 19,734 | 15,399 | 11,232 | 92,718 |
| SHAD | - | 7,667 | 345,685 | 375,503 | 282,729 | 215,575 |
| SHAD ROE | 264 | 489 | 97,697 | 95,216 | 61,617 | 76,326 |
| SMELT #1 | - | 403 | 27,821 | 30,190 | 38,479 | 71,865 |
| #2 | - | - | 5,089 | 5,204 | 6,355 | 19,701 |
| EXTRA | - | 40 | 16,821 | 17,176 | 17,196 | 62,430 |
| SNAPPER, RED | - | 62 | 21,998 | 23,124 | 22,533 | 23,290 |
| SPANISH MACKEREL | - | 36 | 3,859 | 4,531 | 5,131 | 12,834 |
| STEELHEAD TROUT | 200 | - | 5,988 | 5,897 | 9,765 | 9,508 |
| STRIPED BASS | - | 146 | 41,706 | 42,743 | **** | **** |
| SWORDFISH, JAPANESE | - | 4,103 | 381,345 | 389,305 | 450,294 | 323,149 |
| WHITING | - | 74 | 30,006 | 20,761 | 8,287 | 3,973 |
| UNCLASSIFIED | - | 287 | 146,478 | 145,797 | 188,021 | 426,742 |
| TOTAL | 32,311 | 37,995 | 2,621,894 | 2,478,069 | 2,455,938 | 4,599,601 |
| Fresh-Water | | | | | | |
| BUFFALO & CARP | - | 800 | 69,174 | 75,218 | 75,990 | 107,548 |
| CATFISH | - | - | - | - | - | 560 |
| CHUBS & FINS | - | - | 1,975 | 1,439 | 272 | 7,221 |
| CISCOES | - | 787 | 252,166 | 227,275 | 280,221 | 53,491 |
| LAKE TROUT | - | 352 | 43,293 | 43,907 | 54,046 | 66,127 |
| PICKEREL (JACKS) | - | - | 5,863 | 6,189 | 6,515 | 3,797 |
| PIKE, BLUE | - | - | 3,841 | 3,924 | 2,867 | 2,668 |
| PIKE, YELLOW | - | 311 | 88,238 | 89,783 | 82,722 | 35,873 |
| SPOONBILL | 836 | - | 13,873 | 11,878 | 5,205 | 15,795 |
| STURGEON | 5,391 | 8,400 | 597,834 | 613,511 | 661,784 | 328,037 |
| WHITEFISH | 157 | 1,407 | 434,106 | 470,275 | 414,218 | 509,040 |
| YELLOW PERCH | 758 | - | 5,587 | 4,637 | 1,913 | 2,707 |
| UNCLASSIFIED | 495 | 240 | 18,166 | 15,547 | 8,311 | 19,969 |
| TOTAL | 7,637 | 12,297 | 1,534,116 | 1,563,583 | 1,594,064 | 1,152,833 |
| Shellfish, etc. | | | | | | |
| CRABS | 3,600 | - | 50,294 | 41,784 | 28,414 | 16,975 |
| CRAB MEAT | - | - | - | - | - | 78 |
| LOBSTER TAILS, SPINY | - | 390 | *341,386 | 356,277 | 193,821 | 602,368 |
| PULPI | - | 150 | 19,193 | 20,653 | 10,820 | 15,510 |
| SCALLOPS | - | 90 | 69,118 | 69,891 | 52,631 | 398,736 |
| SEPIA | - | 50 | 14,230 | 21,575 | 19,505 | 12,340 |
| SHRIMP | - | 2,417 | 562,533 | 539,027 | 506,397 | 275,073 |
| SQUID | 73,188 | 36 | 274,337 | 146,472 | 35,056 | 269,922 |
| UNCLASSIFIED | 248 | 470 | 8,778 | 9,763 | 6,449 | 9,247 |
| TOTAL | 77,036 | 3,603 | 1,339,869 | 1,205,442 | 853,093 | 1,600,249 |
| GRAND TOTAL | 116,984 | 53,895 | 5,495,879 | 5,247,094 | 4,903,095 | 7,352,683 |

*Includes 232,000 lbs. which is not for sale in this country.
**Included in FLOUNDERS & SOLE.
***Included in SALMON, UNCLASSIFIED.
****Included in SALT-WATER UNCLASSIFIED.

Report # 123, Fri., May 26, 1939.

(Over)

FIGURE 2b.—Reproduction of page 3 of the report shown on page 186.



Page 4.

SALT-WATER MARKET

Unless otherwise stated prices quoted below cover sales of stocks of good merchantable quality by original receivers, in the usual wholesale quantities, on this morning's market.

SUPPLY, DEMAND, MARKET & PRICES:

Supplies moderate, demand light, market quiet.

BLUEFISH: Supplies light, demand moderate. NORTH CAROLINA: and NEW JERSEY: Large 35; Medium 25; Small 20.

BONITO: Supplies light; 8.

BUTTERFISH: LONG ISLAND: Pound Net: Large 5-6. NEW JERSEY: Large 3½-4. VIRGINIA and MARYLAND: Pound Net; Large 5.

COD: Supplies moderate, demand moderate. INSHORE: Steak 5-7; Market 3½-4; OFFSHORE: Steak 4½.

CROAKER: Large 3-3½.

FLOUNDERS: Supplies liberal, demand light. MASSACHUSETTS: Lemon Sole 3-4; Large Mixed 2-3.2. CONNECTICUT: Large Mixed 3; Small 1; market not sold out.

FLUKE: Large 8-10; Medium 4-6; Small mostly 1-1½, few 2.

HAKE: 3-3½.

HERRING, SEA (SARDINE): $2.00 keg.

KING WHITING (KINGFISH): LONG ISLAND AND NEW JERSEY: 1½-3.

MACKEREL: Supplies moderate, demand light, market quiet, Pound Net: Large 3-3/4-4; Gill Net: Large 2½-3.

POLLOCK: Steak 3-4.

SCUP (PORGY): Supplies moderate. Seine: 2-2½. MARYLAND: 2-2½. LONG ISLAND and NEW JERSEY: Pound Net: Mostly 3, some 3½; Drag 1¼-1-3/4.

SEA BASS: Supplies moderate. Pound Net: Large 7-8; Medium 4-6; Small 2-3.

SEA TROUT, GRAY (WEAKFISH): Gutted: Large 12½-14; Medium 8-10; Small 5-6. Round: Large 10-12; Small 2-3.

SHAD: HUDSON RIVER: Supplies light; Roe demand moderate, 8-12½; Buck demand slow, 1-2; Cuts 4-5.

SNAPPER, RED: Supplies moderate, moved very slowly. FLORIDA: Small asking 8. ALABAMA: Medium asking 10.

STRIPED BASS: Supplies moderate, demand good. LONG ISLAND: Pound Net: Mixed 16-18. CHESAPEAKE BAY: Pound Net: Mixed 12½.

TAUTOG (BLACKFISH): 2-3.

TILEFISH: Carried Over: Large 4.

WHITING: Supplies moderate, demand moderate, market firm; $1.00 tub, few $1.50 tub.

YELLOWTAILS: Supplies light; Large 2.8; Small 2-2.4.

CLAMS, HARD: Supplies liberal, demand light, market weak. Chowders $1.00-$1.25 tub; Cherrystones $1.50-$1.75 tub; Little Necks $2.00-$2.25 tub.

CLAMS, SOFT: 75-$1.00 tub and bskt.

CRABS, HARD: $2.00 bskt.

CRABS, SOFT: Supplies heavy, demand light, market dull. Jumbo mostly 40-50 doz. few 60 doz; Prime mostly 20-30 doz, few 35 doz; Medium 10-20 doz.

CRAB MEAT: NORTH CAROLINA: Jumbo Lump 60; Lump 50. FLORIDA: Jumbo Lump 55-65; Lump and Flake Mixed 35-40; Lump 50-55. LOUISIANA: Lump 50-55.

LOBSTERS (100 lb. bbls): Supplies liberal, demand good, market steady. Large, 1¼ lb., Chicken 28.

LOBSTER MEAT: 55-60 can.

SCALLOPS, SEA: $1.10 gal.

FRESH-WATER MARKET

Unless otherwise stated prices quoted below cover sales of stocks of good merchantable quality by original receivers, in the usual wholesale quantities, on this morning's market.

RECEIPTS:

LCL: (Express & truck)--900 pkgs. delivered by 8 A. M.

SUPPLY, DEMAND, MARKET & PRICES:

Trading light today. Market sold out on all varieties except on Buffalofish and Whitefish of which only a small quantity of each species is being carried over.

BLUE PIKE: Mostly 12-13, few 10-11.

BUFFALOFISH: Very light movement; mostly 10-12 few higher.

CARP: CARRIED OVER: WISCONSIN: Freight: Jumbo 3-4; MICHIGAN: Jumbo 4-5, #1--4; LAKE PEPIN: Jumbo 5-6.

LAKE HERRING: BAYPORT: New: Large 8. Carried Over: Small few at 1-2, the remainder dumped or given to charity.

LAKE TROUT: GEORGIAN BAY: Mostly 15, few 16.

PICKEREL (JACKS): 10-12.

SAUGERS: 12.

SHEEPSHEAD: New: Few at 4-5; Carried Over: 1-1½ and remainder dumped.

REDFIN: JEANNETTE CREEK: Carried Over: 5-8.

SUCKER (MULLET): MICHIGAN: New 7-8; Carried Over 6-7.

WHITE BASS: New: Few at 5-6; Carried Over: Some at 1-2, remainder dumped.

WHITEFISH: Demand light, market carrying over small quantity. LAKE ONTARIO: Gill Net: 16-20. LAKE ERIE: Gill Net: 25-27; Pound Net: 28-30; Mixed 23-25. LAKE HURON: Pound Net: 28-30; ST. IGNACE: Gill Net: 21-25; Pound Net: Mostly 27-28, few 25. PARRY SOUND: Dressed 17-18. ALBERTA: Mostly 12-14, few 15. KEY JUNCTION: 22-26. THURSDAY: KEY JUNCTION: Arrived late Thursday morning: 25-27.

YELLOW PIKE: LAKE ERIE: #1--mostly 18-20, few lower; #2--12-14. MICHIGAN: 20-22. SARNIA: Mostly 18-20, some 16-17; Carried Over: Jumbo 13-15.

WEIGH-OUTS BY FISHING CRAFT
FRIDAY, May 26, 1939.

ANNA S.: Scallops, sea 933 gals.
GYDA ELSE: Scallops, sea 1,372 gals.
JULIA K.: Scallops, sea 929 gals.

THURSDAY - ADDITIONAL, May 25, 1939.

KATHLEEN: Whiting 2,000; Squid 2,140.

TOTAL: Scallops, sea 3,234 gals; Fish 4,140 lbs.

SALT-WATER MARKET (CONTINUED)

SHRIMP: NORTH CAROLINA: Southport: Large 12½; SOUTH CAROLINA: Beaufort: Large 12-13. GEORGIA: Darien: Large 12-12½; Brunswick: Large Medium 10-12. FLORIDA: St. Augustine: Large 13-14.

SQUID: Supplies liberal. $1.00-$1.50 box. Mostly 35-60 tub, few 75 tub.

P-4:00 P.M. Wm. H. Dumont, Agent In Charge.

5/26/39--#123--3,4.
UNITED STATES DEPARTMENT OF COMMERCE
BUREAU OF FISHERIES
Division of Fishery Industries
MARKET NEWS SERVICE
33A Fulton Street
New York, N. Y.
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OFFICIAL BUSINESS

Penalty for Private Use to Avoid
Payment of Postage $300.

John Doe

5702 - 26th St., N.E.

Seattle, Wash.

FIGURE 2c.—Reproduction of page 4 of the report shown on page 186.

Twenty-two species accounted for 74,564,000 pounds, or 94 percent of all salt-water fish received. Over 2,000,000 pounds of each of the 11 leading varieties were received, forming 79 percent of the total. In order of their importance they were cod, flounders (blackbacks or winter flounders), mackerel, haddock, butterfish, scup (porgy), yellowtails (dabs), whiting, halibut, shad, and croaker. Receipts of six species ranged from one to two million pounds, or 10 percent of the total. They were gray sea trout (weakfish), fluke (summer flounder), bluefish, gray sole, sea bass, and salmon (Western). The five species received in amounts from one-half to one million pounds were sea herring (including sardines), hake, striped bass, pollock, and tilefish.

Groundfish (cod, haddock, hake, and pollock) accounted for 26 percent of the total receipts during the 6-month period. Flatfishes from the East coast, consisting of blackbacks, flounders, fluke (summer flounder), gray sole and yellowtails, formed 21 percent; and Western halibut and salmon, a little over 5 percent. Varieties caught in large quantities in the Middle Atlantic States, such as butterfish, mackerel, scup (porgy), gray sea trout, sardines, and whiting, made up 10 percent. Of the remaining species, those fish taken in large amounts in other areas as well as in the Middle Atlantic (bluefish, croaker, sea bass, shad, and striped bass) represent 31 percent of the receipts.

The three leading varieties of shellfish received during these 6 months were shrimp, 5,343,000 pounds; lobsters, 2,150,000 pounds; and squid, 1,671,000 pounds.

Since detailed receipts for the fresh-water market were not collected, exact quantities cannot be given. However, from daily experience in the market it can be stated that whitefish and yellow pike were the leading species among the higher-priced fish, while carp was important in the lower-priced group.

The distribution of fresh and frozen fish and shellfish in the New York area was effected largely through 92 wholesale dealers, 20 hotel and restaurant supply firms, and 7 brokers. Of the wholesale dealers, 24 handled fresh-water fish exclusively, 3 sold fresh-water and salt-water fish, while the remainder were mainly either salt-water fish or shellfish firms. There were 12 fillet-cutting firms in addition to several of the hotel-supply firms that produced their own fillets.

The delivery of fish and shellfish to local or suburban purchasers generally is made by trucks owned by the buyers. Trucking agencies and rail express carry the balance.

The retail outlets for fish in New York City have been estimated by the City Bureau of Markets to include 1,500 independent stores that handle fish exclusively, 1,800 meat stores selling fish part of the time, and 700 general markets and chain stores which handle fish.

The wholesale dealers handling fresh and frozen fishery products in New York are centered in a marketing area comprising about four square blocks along the East River near the foot of Fulton Street and just south of the Manhattan end of the Brooklyn Bridge. Known as Fulton Market, the wholesale fish trade has been in this location over a century. Dealers handling salt-water fish and shellfish occupy the greater part of the area, the fresh-water fish dealers practically being limited to one street known as Peck Slip. As there are no direct rail or express connections all shipments must be trucked between the market and the terminals. Many of the latter are situated at a considerable distance across the city. Two freezers adjoin the market area while the remaining plants storing frozen fish are widely scattered. Fishing vessels discharge their fares at one of several piers extending into the East River. The catch usually is barreled or boxed on the pier for trucking to the dealer's stand or for immediate shipment.

On the site of a market building which collapsed into the East River in 1936, a modern structure has been erected by the city and leased to an organization of the wholesale dealers. It contains well-designed stands on the ground floor with ample office space and dressing rooms above, and is supplemented by a large parking area in front and a receiving platform and bulkhead dock in the rear. Providing many advantages over the older types, the new market building was opened in June 1939. The Fishery Market News Service office is located in a building on the edge of the market area.

The operations of the Fishery Market News Service office in New York City during 1938 were carried on and the daily report issued under the supervision of W. H. Dumont, Senior Fisheries Marketing Agent, assisted by E. C. Hinsdale, Fisheries Marketing Agent (transferred to Chicago during the year), F. J. Anderson, and W. D. Glidden, Jr., Junior Fisheries Marketing Agents, and Joseph Pileggi and Peter DiMarco, Senior and Junior Clerk-Stenographers, respectively.

### BOSTON, MASS.

The first issue of the Boston Fishery Market News Report was released on May 26, 1938. It covers the daily activities of this important fishing port in considerable detail. Hailing fares of the offshore and inshore fleets landing at Boston Fish Pier—otter trawlers, draggers, line trawlers, hand liners, gill netters, purse seiners, and harpooners—are listed in one large table, which also includes the first sales prices of each species in the catch. To aid in the orderly marketing of Boston's huge supply of fish much additional information is included. The current landings at other ports, both nearby and distant—Gloucester, New Bedford, and Provincetown, Mass.; Portland and Rockland, Maine; New York, N. Y.; Seattle, Wash.; and Prince Rupert, B. C.—are received by telegraph and made available early each morning. Rail freight, rail express, and coastwise steamship arrivals are not only covered for the period since the preceding report, but a section for additional receipts includes shipments by rail and steamship, mostly fish and shellfish from Canada, due to arrive later in the day. Other daily compilations include imports of fishery products from all countries, prices paid to shippers of fishery products by dealers on the pier, and the movement of over 30 fishery commodities into and out of cold storage. Weekly, comparative holdings are published for the current and preceding weeks and for 4 weeks and 1 year previous. In order to be of the greatest aid to the industry, the daily report is completed and delivered to the dealers on and in the vicinity of the pier each forenoon and, for delivery outside Boston, is placed in the mail at noon.

Boston is primarily a production center, supplying enormous quantities of fresh and frozen fishery products to the Nation. It is well situated with the natural advantages of an excellent harbor and nearness to both producing and marketing areas. It also has good handling and shipping facilities.

The Boston Fish Pier, the largest in the world devoted exclusively to the fish business, is the outgrowth of the importance of the fishing industry to Boston. The pier itself extends 1,200 feet into the harbor and is 300 feet in width, the entire property comprising 537,000 square feet. It was built at a cost of $3,000,000 and was opened on March 30, 1914. Approximately 350,000,000 pounds of fish are landed at the pier annually.

The pier is divided by a wide center street flanked on each side by buildings especially designed and constructed to house the activities of the wholesale dealers occupying the individual stores. Besides sufficient space for the receiving, processing, packing, and shipping of fish, they also contain offices and storage rooms. Each store has a front entrance on the center street and a rear entrance on a mooring side of the pier, thus making it possible for fish to be taken directly from the vessel into the rear entrance, processed, packed, and delivered to a waiting truck at the front entrance.

A large cold-storage plant is located at the shore end of the pier. It has a capacity of 15,000,000 pounds of frozen fish as well as adequate freezing and icing facilities. In addition, there are three other public cold-storage plants near at hand that freeze and store fish.

The New England Fish Exchange is located in a building on the outermost end of the pier. It is here that all trips of fish are sold. The Exchange is open early each morning, except on Sundays or holidays. If desiring to sell in or over the Exchange the captain of each vessel is required to register his catch with an officer of the Exchange before it can be auctioned. The detailed fare of each individual trip is posted on blackboards for the inspection of the buyers. All bidders or buyers must be members of the Exchange. Every effort is made by the vessel captains to make port prior to the opening of the Exchange in order to obtain top prices.

The bidding commences at 7:15 a. m. Each captain has the alternative of making his own sale or engaging an authorized agent to do his selling for him. The auctioneers are on a raised stand in the center of the Exchange around which the buyers gather. The auctioneer announces the amount and kind of fish he has to offer, accepts bids, and sells to the highest bidder. The buyer may buy part or all of any trip. All purchasers are presented with settlement slips which must be paid before the closing of that day's business. The sales continue throughout the day until all fish are sold. Each morning the sales begin with new arrivals, since fish seldom are carried over unless the owner or captain finds it advantageous to do so.

The Boston Fish Pier is a scene of great activity throughout the day. Fish is being moved in all directions as soon as the first sales are consummated. From the vessel's side to the dealer's premises the fish generally are transported in large two-wheeled carts, hauled by hand or motortrucks.

Good transportation facilities add to the importance of Boston as a producing center. On the pier a railroad spur on each side of the cold-storage plant makes it possible to load directly into cars or unload directly into the freezer. Two large trucking firms have platforms to receive and send shipments. All of the stores have loading platforms to accommodate trucks of various sizes. The finished products are loaded at these points for local or State-wide distribution. In addition, large refrigerated trucks receive cargoes for distant delivery. These trucking lines maintain daily schedules and extend as far west as Denver. A fleet of trucks carries express shipments from the pier to rail terminals. Much of the fish shipped to New York is transported in carlots on special freight trains operating on a fast schedule.

There are about 90 wholesale fish establishments and manufacturers of fishery products in Boston. They handle fresh and frozen fish and shellfish, and produce fillets, salted, smoked and canned fish, crab and lobster meat, cod-liver oil, glue, fish meal, and fish oil. In addition, there are a number of commission merchants who handle shipments of fish and shellfish to the Boston market.

Boston is not only an important producing center, but it also offers a market for fish from other sections of the country. Receipts of salmon and halibut from the Pacific Coast; frozen swordfish from Japan; frozen shrimp from the Gulf; fresh-water fish from the Great Lakes and inland States; and large quantities of lobsters, other shellfish, and fish from the Maritime Provinces of Canada and from Newfoundland add to the supply of native varieties.

The importance of Boston as a fishing port is emphasized by the amount of fish landed during the last 7 months in 1938, the period during which the Market News office operated. Landings totaled 174,569,000 pounds, valued at $4,249,000, during this period. Haddock accounted for 67,565,000 pounds, valued at $1,596,000, or 39 percent of the total receipts and 38 percent of the total value. Cod followed with 40,173,000 pounds, valued at $873,000. This represents 23 percent of the landings and 21 percent of the value. Rosefish (redfish) came next in poundage with 18,132,000 pounds, valued at $222,000, forming 10 percent of the catch and 5 percent of the value. Mackerel, with 11,545,000 pounds, valued at $386,000, made up 7 percent of the receipts and 9 percent of the value. Species landed in lesser quantities included, in the order of their importance, pollock, flounders (blackbacks, dabs, gray sole, lemon sole, and yellowtails), whiting, hake, cusk, swordfish, halibut, and wolffish (catfish).

The above totals do not include the fish landed and sold to dealers across the harbor on Atlantic Avenue; the quantity landed by undertonnage boats; imports; nor the receipts of fish and shellfish by truck, rail express, rail freight, and coastwise vessels.

Early in 1939 the Boston office began to release a monthly summary of the receipts and prices of a number of the more important species landed at the Fish Pier and sold through the New England Fish Exchange. The summary is a daily compilation of the quantities landed, the first sales prices, and the average prices. A series of comparative figures for the current month, the preceding month, and the preceding year also are included.

The activities of the Boston office and the issuance of the daily report and the monthly summary were under the supervision of B. E. Lindgren, Senior Fisheries Marketing Agent. He was assisted by C. W. Morrison, Junior Fisheries Marketing Agent, and J. J. O'Brien, Senior Clerk-stenographer.

### CHICAGO, ILL.

The Chicago Fishery Market News office, through a daily Fishery Products Report and a monthly summary of wholesale receipts, records the receipts, prices, and similar valuable information concerning fishery products, mainly fresh water, entering Chicago. The first daily report was released September 1, 1938. The daily report provides current information on the arrivals of fish by means of a tabulation of truck, rail express, and rail freight arrivals each morning. Species and poundage are shown as well as the shipping State or Canadian Province. Market prices received by shippers are quoted daily in considerable detail. The movement of fishery products into and out of cold storage is reported daily for approximately 45 varieties. Each week holdings are published for the current and preceding weeks and for 4 weeks previous. When sufficient data have accumulated, holdings for the previous year also will be incorporated.

Summaries of the wholesalers' receipts have been issued monthly since September 1938. They include tabulations of receipts by quantity, species, method of transportation, and State or Province of origin.

During the first 6 months the Chicago office operated, nearly one-fourth of Chicago's fresh- and frozen-fish receipts consisted of two species—lake trout and halibut. The large contribution of these two single species to the total receipts is surprising, in view of the fact that scores of other varieties of fresh- and salt-water fish are handled in the local market.

The species leading in importance with respect to receipts included, in addition to lake trout and halibut, the following, in order: Sauger, shrimp, yellow perch, oysters, whitefish, lake herring, yellow pike, rosefish, carp, and chubs. These 12 species accounted for more than 80 percent of the total receipts for the 6 months. During the same period, 18 additional species of fresh and frozen fresh-water fish, 32 additional salt-water species, and 13 other shellfish and miscellaneous commodities—a total of 75 species—were received in Chicago.

During the 6-month period aggregate receipts of fresh and frozen fish and shellfish in the Chicago market amounted to 19,200,000 pounds, or an average of 3,200,000 pounds each month. This quantity would supply 1 pound of fish per capita each month to Chicago's population. However, a considerable part of the fish received in Chicago is not consumed locally but is reshipped to communities outside Chicago. During the month of February 1939 reconsignments of fishery commodities amounted to about 1,000,000 pounds, or nearly one-third of the total receipts during the month. Such reconsignments are said to reach as high as 60 to 75 percent of the total receipts in some months, but in others they may amount to only 20 to 25 percent, or less.

As might be expected, due to its closer proximity to the fresh-water producing areas of the United States and Canada, Chicago is primarily a fresh-water fish market. About 3 pounds of fresh-water varieties are received to each 2 pounds of salt-water species. It is interesting to note, however, that 4 salt-water species are included among the 12 most important varieties. These are halibut, from the Pacific Northwest; shrimp, from the Gulf Coast; oysters, from the Atlantic Coast; and rosefish, from New England. The fresh-water varieties emanate largely from the Great Lakes of the United States and Canada; Lakes Manitoba, Winnipeg, Rainy, Dauphin, Nipissing, and Nipigon, Lake of the Woods, and the Pigeon River of Canada; and the Mississippi River and tributaries of the United States.

Virtually all fish received in Chicago arrive by three types of carriers. These are, in order of their importance: Rail freight, motortruck, and rail express. While rail freight leads among the types of carriers when considering all receipts, we find that it follows the motortruck when considering receipts from domestic sources only. This predominance of the motortruck in carrying domestic fish is influenced especially by the hauling of fresh-water fish from neighboring States. However, the truck also is an important factor in more distant hauls; for instance, truck receipts of rosefish from Massachusetts for the 6-month period amounted to the equivalent of nearly 30 carloads. Considerable quantities of other groundfish also were received by truck from New England and truck shipments of shucked oysters from Chesapeake Bay were important. In earlier years steamers transported quantities of fresh-water fish from lake ports to Chicago by water. More recently, this factor in the receipt of fish at this market is considered negligible. Between a million and a million and a half pounds of fish normally are landed each year on Chicago's lake front by local commercial fishermen.

Chicago's distribution of fresh and frozen sea food is largely effected through its 62 wholesale dealers, 10 brokers, 10 hotel and restaurant supply firms, and 14 fish smokers; all of which are primarily direct receivers. Some 200 retail dealers who handle fish exclusively may at times receive direct shipments; however, most of their requirements are purchased through the Chicago wholesale market.

With only a few exceptions Chicago's wholesale dealers, who are direct receivers of fishery products, are concentrated in a central location west of the downtown business section. All receipts must be brought to this market by truck since it is not located on the water nor is it served directly by rail. Cold-storage plants are situated in the same general area, being readily accessible for either the storage or withdrawal of fishery products. The Fishery Market News Service office is within one block of the market area.

Delivery of fish from the Chicago wholesale market to local and suburban buyers may be effected either by trucks owned by the wholesale dealers or in the trucks of the buyers. The services of trucking agencies or rail express are used for longer hauls. Frequently, in the instance of carlot sales, the entire car is diverted to the buyer without a preliminary opening in Chicago. This occurs quite frequently in sales of halibut and salmon arriving from the Pacific Coast.

The old-style fish hucksters are factors of decreasing importance in the distribution of Chicago's fish, but they are being replaced by modern so-called hucksters who operate up-to-date refrigerated trucks on established routes throughout the outlying sections of the mid-Central States.

During 1938 the activities of the Chicago office and the issuing of the daily report and monthly summary were supervised by E. C. Hinsdale, Fisheries Marketing Agent, assisted by B. F. Lucarz, Junior Clerk-stenographer.

### SEATTLE, WASH.

The Seattle office of the Fishery Market News Service issued its first daily Fishery Products Report on October 1, 1938. The report includes data on the daily receipts and prices of fishery products at Seattle, with separate sections for each major fishery. Statistics on imports of fresh, frozen, and cured fishery products from British Columbia and coastwise vessel receipts from Alaska are also shown. Other features include halibut landings and prices at Prince Rupert, as well as carloads of fish shipped daily from Prince Rupert and Seattle. Through daily telegrams from New York and Boston, data are included on Eastern market supplies and prices of West coast fish and competing species, as well as the cold-storage movement and holdings of important varieties.

An addition to the Seattle Market News report, effective May 1, 1939, is the daily coverage of halibut and salmon landings in southeastern Alaska. The receipts and prices of these species at Juneau, Ketchikan, Petersburg, and Sitka on a daily basis, and Wrangell on a weekly basis, are now incorporated in these reports. During 1938, Alaska halibut landings amounted to nearly 8,000,000 pounds, and troll-caught salmon landings in southeastern Alaska exceeded 10,000,000 pounds. Information on the daily receipts and prices of these species in Alaska adds materially to the value of the reports.

During the 12-month period ending December 31, 1938, there were nearly 51,000,000 pounds of fishery products landed at Seattle by vessels of the halibut fleet and other local craft. These products had a basic value of $3,275,000 to the fishermen. In addition, it is estimated that approximately 20,000,000 pounds of halibut and salmon were received in Seattle by coastwise vessels from Alaska and freighters from British Columbia.

Of the Seattle fish receipts, two species—halibut and salmon—contributed over 72 percent; halibut leading all species with 41 percent of the total receipts. Only 8 other species of fish were received regularly by Seattle wholesale dealers during 1938. These, in the order of their importance, were: Flounders, 4,048,500 pounds; sablefish, 2,756,400 pounds; "lingcod," 2,708,200 pounds; herring, 727,400 pounds; rockfishes, 620,500 pounds; cod (true cod), 432,200 pounds; smelts (eulachon and silver), 320,800 pounds; and perch, 121,900 pounds. There were also approximately 800,000 pounds of albacore tuna received in Seattle, nearly all of which was frozen for canning at Anacortes. In addition, small quantities of California mackerel, barracuda, bonito, sea bass, and yellowfin and bluefin tuna are also received for the Oriental trade.

Of the shellfish receipts at Seattle, the "Dungeness" crab is the leading item, amounting to 1,752,900 pounds, valued at $79,068 to the fishermen. Most of these crabs are taken in the ocean off Willapa and Grays Harbors. Other species of shellfish received in Seattle include Pacific and Olympia oysters, hard-shell clams (butter and little-neck), razor clams, bay scallops, shrimp, octopus, and squid. The Olympia oyster is one of the highest-priced species of shellfish in this country, selling wholesale in Seattle at $8 per gallon. Octopus and squid are consumed almost entirely by the Orientals. In this connection it is interesting to note that the Puget Sound production of squid is not nearly enough to take care of the local demand. Considerable quantities of fresh squid are received from Monterey, Calif., and last fall a carload of frozen squid was shipped from Massachusetts to Seattle. The local supply of shrimp is nearly exhausted, and Seattle depends largely on Alaska shrimp meat for this sea food. There are occasional shipments of California shrimp to Seattle, and an attempt is now under way to market frozen headless shrimp from Texas in Seattle.

Over 90 percent of the Seattle wholesale fish business is conducted by 12 establishments. Of these, six firms handle over 75 percent of the fishery products coming into Seattle. There are two fish exchanges, one for halibut-fleet landings and the other for selling troll-caught salmon of the Fishermen's Cooperative Association. The halibut exchange is operated by 10 wholesale firms and is called the Seattle Fish Exchange. Bidding is open only to member dealers, and the minimum bid change permitted is one-eighth cent per pound. The hailing fare of a halibut vessel must be posted on the board by 9 a. m., if it is to sell that day. A dealer must bid on the entire fare. There are no split trips sold over the exchange.

The salmon exchange, operated by the Fishermen's Cooperative Association, is similar to the halibut exchange. Bidding is graduated in eighths of a cent, and is open only to members of the Seattle Fish Exchange. Truck deliveries of salmon from the Washington coast, as well as deliveries by fishing craft and transporters from Neah Bay, are sold over this exchange. Receipts of other fishery products at Seattle are by direct purchases. In this case a price is usually set at the beginning of the season and is generally constant throughout its duration. Most of these prices are for delivery in Seattle, which leaves the trucking charges to the fishermen. As a rule the dealers send their fishermen a check once a week when several deliveries are made during the week.

There are five fish freezers and cold-storage plants in Seattle, in addition to one cold-storage plant for mild-cured salmon and salted herring. Two of the fish freezers are owned by wholesale fishery firms, two are privately owned freezers, and the other two are operated by the Port of Seattle.

Fishery products arrive at Seattle almost entirely by vessel or truck. An occasional "less than carload" rail shipment from Vancouver, B. C., or Astoria, Oreg., is received. In the past there have been carloads of fish and shellfish to Seattle from the Atlantic Seaboard, but these are now rare. At times Seattle receives large quantities of fresh and frozen halibut and salmon from Alaska and British Columbia. Arrivals of over 250,000 pounds of fish from Alaska in 1 day are not unusual. Receipts of white king salmon for kippering and large red kings for mild cure from British Columbia have exceeded 3,000,000 pounds annually at Seattle.

Unlike most cities, Seattle's wholesale fishery dealers are not concentrated in one location. There is no "fish pier" or wholesale fish-trade section. Most of the dealers are located on piers at which fishing craft may discharge their fares. Although the dealers are situated at widespread intervals along the water front the arrangement is not necessarily inefficient, since most vessels sell their entire catch to one firm. All companies on the water front are adequately served with spur tracks and facilities for transportation by truck over short or long hauls. The Fishery Market News Service office is located near the fish exchanges and the greatest concentration of dealers.

The cold-storage plants are spread out as widely as the dealers. Most are served both by steamship and railroad.

During 1938 the Seattle office was operated and the daily reports were issued under the supervision of V. J. Samson, Fisheries Statistical and Marketing Agent, assisted by K. G. Nordquist, Junior Clerk-stenographer.

### JACKSONVILLE, FLA.

Late in 1938 the Jacksonville Fishery Market News office was established and preparations made to issue a daily report on fishery products. The first report was issued on March 6, 1939. Current data are published covering the production and prices of fish and shrimp produced on both coasts of Florida—from Fernandina to the Florida Keys on the Atlantic Coast, and from Everglades to Pensacola on the Gulf. Since the coast lines are long, and the fishing areas not only numerous but also widely separated, it is not possible to procure complete information on all varieties and for all localities with the funds and personnel available. To improve this situation part-time agents are being placed in several of the more important production centers on both coasts in order that a full report may be secured for these areas. It is believed that complete knowledge of the activities in several areas on each coast will be more valuable than partial information from the whole State, and will indicate the trend of production and price in the State generally.

Since Jacksonville is an important distribution point for fishery products bound for markets in other States, a record of outgoing shipments by rail freight, rail express, and motortruck is carried in the report. Through a cooperative arrangement with the Florida State Department of Agriculture, data on truck shipments are obtained in considerable detail. This information includes the quantity of each species and the destination by State. Data on the county of loading in Florida also are secured but not published. Receipts and prices of Southern fish and shellfish and competitive Northern species on the New York market are received by wire, and reported together with a summary of landings and first sales prices at Boston. The movement and holdings of fishery products in a number of the most important cold-storage plants in the South Atlantic and Gulf States are shown on a weekly basis with comparative holdings for the preceding week and for 4 weeks previous. The cold-storage plants are located from North Carolina to Texas. The varieties stored are divided into 34 classifications, 24 being salt-water fish, 4 fresh-water fish, and 6 shellfish.

At frequent intervals, through the cooperation of the Food and Drug Administration, data on shrimp packed in canneries utilizing its Seafood Inspection Service are released. The information includes, for each period and for the season, the number of plants operating, the number of days operated, the quantity of raw shrimp received, the pounds of raw shrimp packed, and the number of standard cases of shrimp canned. The shrimp canneries number about 40 and are situated in Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas.

The Fishery Market News Service office is located in the downtown section of Jacksonville, one block from the St. Johns River. In this area most of the wholesale fish dealers are concentrated. They are favorably situated with respect to all forms of transportation utilized for either incoming receipts or outgoing shipments. Spur tracks are available near most of the establishments for carlot shipments, and the express terminal is easily reached with a minimum of interference from city traffic. Fishing craft and commercial steamships berth at piers extending into the river. Shipment by truck is facilitated, since the location is but one block from the main highway traversing the city. Although the cold-storage plants do not adjoin the wholesale fish-trade section they are readily accessible.

In 1938 the Jacksonville Fishery Market News office was supervised by S. C. Denham, Fisheries Statistical and Marketing Agent. He was assisted by J. E. Borum, Junior Clerk-stenographer.

## COOPERATIVE MARKETING

The cooperative marketing unit of the Division was under the direction of L. C. Salter from the time of its organization in 1935 until December 31, 1937, when he resigned from the Bureau's service to accept a position with the Tennessee Valley Authority. Following this the unit was administered directly under the chief of the Division until August 1938 when Ralph Russell, Associate Fishery Economist, was appointed to take charge of the unit.

Since his resignation, Mr. Salter has been working on the preparation of a report incorporating the results of much of his survey work with the Bureau. This report, when completed and released, will cover much valuable information concerning the operation of fishery cooperatives.

During 1938 work was continued on the collection of data relating to fishermen's cooperatives and other organizations in this country and abroad. During the past year cooperatives have been organized in several States. Appeals for assistance in the organization of cooperatives have been received from many sections of the country, and such assistance has been rendered as has been possible with the limited staff and funds available for this work.

Arrangements have been completed to enlist the aid of statistical and marketing agents of the Bureau, who visit virtually all the commercial fishing areas of the United States each year, to assist in keeping the data on fishermen's organizations current. They will obtain reports from fishermen's cooperatives during the course of their surveys and forward them to the Washington office for study. This procedure should facilitate the maintenance of adequate files on the status and activities of domestic cooperatives.

A possibility for further cooperative activity by fishermen, which seems at present to have been but little explored, is the opportunity of joining cooperatives already formed. For instance, supplies of various kinds, particularly petroleum products, are handled by cooperatives operating over large areas. Fishermen in some cases may become members of these cooperatives or induce the cooperatives to set up branches in locations accessible to the fishermen. Credit unions, which are cooperative savings and loan associations, have been extensively developed. These would seem to offer to fishermen a possibility of assistance through accumulating and borrowing capital by membership in such organizations. Cooperatives furnishing groceries and other consumers' goods also are available to fishermen in some parts of the country. Through joining these and other cooperatives, fishermen may make economic gains and learn cooperative techniques which may apply in their own occupation.

The Bureau offers its assistance to groups of fishermen interested in the forming of cooperatives to the extent that its facilities can be devoted to this end.

## TECHNOLOGICAL INVESTIGATIONS

As has always been emphasized in previous annual reports of this Division, the primary purpose of our technological investigations is to bring about more efficient and more profitable utilization of the products of our fisheries. This is in line with, and in the best interests of, the conservation of the natural resources of this country because, in its broader sense, conservation includes the wisest and most complete utilization of our fishery harvest that modern science can make possible. Thus, technological investigations of the Bureau of Fisheries have been devoted to the improvement of existing methods and the development of new methods of utilization and preservation of aquatic products. Widening the uses of these products is another important phase of the work of our technologists. As the result of such studies during the past years, our technologists have been able to suggest gradual improvements in the industry and some of these suggestions have been placed in practical use. It is believed that there could be more widespread utilization of these improvements to the ultimate profit of the industry.

Furthermore, our technological investigations, from time to time, have resulted in outstanding discoveries which have been the basis of new industries in the fisheries. A number of these discoveries were discussed in the 1937 annual report of this Division and referred to such subjects as the new domestic industry of producing fish oils and fish-liver oils as sources of vitamins A and D for both human and animal nutrition, the rapid discoveries and developments in the quick-freezing industry in which technologists of this Bureau pioneered, and the improvements and increases in the manufacture of fish meal as a highly important ingredient of livestock feeds.

### LABORATORIES

During 1938 the Division carried on its technological studies under the direction of Dr. J. R. Manning, Senior Technologist, at its laboratories located in Washington, D. C., College Park, Md., and Seattle, Wash. In addition, members of our technological staff cooperated in the conduct of investigations in the laboratories of the University of Maryland and Maryland State Agricultural Experiment Station at College Park, Md.; the University of Washington, Seattle, Wash.; and Washington State College, Pullman, Wash.

By means of funds allotted from the Public Works Administration and the Works Progress Administration, improvements were made during the year to the technological byproducts laboratory building and the chemical laboratories in Seattle, Wash. These included the placing of a brick veneer on the outer walls of the byproducts building, painting the interior, and staining the roof of this building, installing compressed-air lines and an additional sink, including lead linings in the floor drains and sumps, painting the walls in the chemical laboratories, and constructing a tunnel dryer and a combination brine and sharp freezing cabinet.

The major portion of the work of the Seattle laboratory organization in 1938, as in past years, consisted of investigations of byproducts, although some studies were made in the general field of preservation of fishery products for food. The greater part of the work of the College Park laboratory organization was devoted to chemical and bacteriological studies in connection with the preservation of fishery products for food, and pharmacological and nutrition studies of the constituents of fishery products, although some work was done on byproducts in connection with the chemical preservation of fish waste or waste fish. The work of the Washington laboratory was confined to studies on the canning of fishery products.

The following personnel, in the various laboratories listed below, contributed to the technological investigations described in the ensuing pages of this report:

*College Park, Md.*—J. M. Lemon, Technologist in Charge; W. T. Conn and S. R. Pottinger, Assistant Technologists; Dr. H. W. Nilson, Assistant Pharmacologist; C. F. Lee, W. B. Lanham, Jr., and A. L. Fowler, Junior Chemists; J. F. Puncochar and Dr. R. J. Reedy, Junior Bacteriologists; H. E. Crowther, C. E. Swift, and R. H. Flowers, Research Associates; L. F. Ortenzio, H. F. Kraybill, N. G. Sprague, L. J. Barton, R. C. Dawson, Roscoe Dwiggins, J. D. Rollow, D. K. Worgan, and Ned Oakley, student assistants.

*Seattle, Wash.*—R. W. Harrison, Technologist in Charge; M. E. Stansby, Assistant Technologist; Charles Butler, William Clegg, Jacob Ash, and Mrs. Marie Sater, Research Assistants.

*Washington, D. C.*—N. D. Jarvis, Associate Technologist.

## PRESERVATION OF FISHERY PRODUCTS FOR FOOD

During 1938 studies on the preservation of fishery products for food consisted of the following projects: Studies of rancidity in fish; studies of lactic acid as a possible index of decomposition in frozen fish; identification of canned salmon; changes in the composition of pink salmon (*Oncorhynchus gorbuscha*); composition of commercial species of fish taken on the Pacific coast; and canning aquatic products.

### STUDIES OF RANCIDITY IN FISH

This project has been under investigation for the past several years. It is one which presents some very difficult technical problems. We have been conducting it in cooperation with the Musher Foundation, Inc., of New York City, as that organization is interested in the application of certain antioxidants in all of the food industries and had already carried out considerable original research on the problem of preventing the various forms of rancidity in different types of foods before our technologists undertook a study of the aspects dealing specifically with fishery products. The Bureau's Seattle and College Park laboratories have both been working on the project, but dealing with different phases of it, and the Musher Foundation has employed and stationed research associates in both of these laboratories for this purpose. Progress reports have been published from time to time, as described in previous annual reports of this Division and, during 1938, a report was given at the September meeting of the American Chemical Society in Milwaukee, Wis. This report deals specifically with the use of a water extract of the active principle of oat flour as the antioxidant. Boston mackerel were treated with this extract and then frozen by the usual commercial method. As a means of comparison, control samples of Boston mackerel were given the usual commercial handling without the application of the extract of antioxidant and were frozen. Periodic examinations of these samples over a period of 6 months indicated that those fish treated with the oat flour extract were of definitely superior quality to the untreated samples.

These results are very interesting because earlier studies of the direct application of oat flour, or solvent extracts prepared from oat flour, gave only a very mild protective action, not sufficiently pronounced to attract the interest of the fishery industries for commercial application. Moreover, the direct application of oat flour detracted from the appearance of the resultant product and the solvent extracts were of limited application because of their oily nature. However, tests conducted in the College Park and Seattle laboratories thus far of the water-soluble extracts of oat flour and concentrates prepared therefrom did not affect the appearance of the fish so treated and, as indicated above, were much more effective in retarding rancidity. Therefore, these water-soluble extracts of oat flour are being tested on fresh salmon prior to canning, mild-cure salmon, kippered salmon, frozen salmon, and frozen halibut. In the case of the mild-cure and kippered salmon, the extracts were used in conjunction with the normal brining processes while in the frozen products the extracts are being used in connection with washes prior to freezing and in the glazing bath. Since these latter tests are now being run under commercial storage conditions, sufficient time has not elapsed to permit definite conclusions. So far, only moderate improvement has resulted. Such results must be attributed more to the extreme difficulty of retarding rancidity in fish oils than to the lack of effectiveness of the cereal flour products as antioxidants.

## STUDIES OF LACTIC ACID AS A POSSIBLE INDEX OF DECOMPOSITION IN FROZEN FISH

Progress on this project was interrupted during 1938 because of the resignation of the investigator assigned to the problem. Another chemist has recently been assigned to the work.

It is known that lactic acid rises to a maximum content in fish muscle during the rigor of death, and the importance of muscular rigor, in its relation to the onset of spoilage in sea fish, has been emphasized by other investigators in this field. It has also been shown that the alkaline reaction of fish muscle and the accompanying onset of spoilage of the fish follows after the loss of muscular rigor. Thus it is evident that, since spoilage occurs after the lactic acid content of the fish muscle reaches a maximum, the determination of lactic acid in fish flesh before and during a period of cold storage is of value in obtaining direct knowledge of the processes of decomposition of fish.

Recently, sea trout have been obtained by our technologists from Chesapeake Bay and have been frozen under varying conditions of freshness. Lactic acid determinations have been made on these fish before storage and at regular intervals during storage. Results obtained at this point of the investigation indicate that the lactic acid content of sea trout muscle varies from 0.05 percent to 0.40 percent. Sea trout frozen while in muscular rigor show a higher lactic acid content than those frozen under the other conditions of relative freshness or decomposition.

### IDENTIFICATION OF CANNED SALMON

Studies on the possibility of differentiating between the species of salmon, on the basis of the refractive index and color of the free oil in the canned product, were continued. A statistical analysis of the data obtained during the preceding year indicated that the data at hand were not sufficient for satisfactory interpretation. Accordingly, additional samples have been taken, and sampling will be continued until enough data have been obtained to permit a thorough investigation of the reliability of such a method for identifying the various species of salmon after canning.

### CHANGES IN THE COMPOSITION OF PINK SALMON (*Oncorhynchus gorbuscha*)

Pacific salmon, especially the pink or humpback, are known to undergo considerable physical change during their spawning migration. This change is manifest by a gradual decrease in the pigmentation of the flesh, softening of flesh texture, and a decrease in the fat content of the edible portions. Generally speaking, the fish are believed to become poorer in quality until a point is reached where they are considered no longer suitable for canning. Salmon, however, are consumed as a protein food and very little information is available regarding the relation of these apparent changes to the nature of the protein present.

A chemical study of this problem was undertaken during the summer of 1937 and was continued during the past year. The actual chemical determinations have been completed and the data are being assembled and analyzed for publication. While it is considered inadvisable to draw definite conclusions at this time, the data, which involve analyses for moisture, fat, protein, ash, soluble nitrogen, heat coagulable soluble nitrogen, free amino nitrogen, copper precipitable nitrogen, phosphotungstic acid precipitable nitrogen, and the amino acids cystine, tyrosine, tryptophane, and arginine, would indicate that the pronounced change in the appearance and texture of the flesh is accompanied by much less change in its chemical nature.

### COMPOSITION OF COMMERCIAL SPECIES OF FISH TAKEN ON THE PACIFIC COAST

The Bureau of Fisheries receives numerous inquiries from both the producer and consumer of fishery products regarding the composition of various food fish and the relative amounts of wastage involved in dressing. In seeking the necessary information, it is found that much of the data required is either not available or of a very fragmentary nature. Accordingly, during the past year studies were undertaken for the purpose of determining the relative proportion of edible and inedible material in food fish taken commercially on the Pacific coast and to determine the "proximate" chemical composition of the edible portion. The measurements include percent dressed weight, percent trimmings, percent viscera, percent liver, percent flesh, percent bone, percent skin based on the round weight of the fish, the proportion of the dressed weight which is flesh, bone, and skin, and percent moisture, fat, protein, and ash in the edible portion. Numerous samples of each of 22 different species of fish have been analyzed to date. These are: Albacore tuna, sea bass, gray cod, "lingcod," red cod, rock cod, lamprey eel, starry flounder, halibut, herring, sea perch, pilchard, orange rockfish, sablefish, chum salmon, pink salmon, silver salmon, sockeye salmon, roe shad, English "sole," king "sole," and turbot. The analyses are being continued and the data will be assembled in report form.

## CANNING AQUATIC PRODUCTS

For the past several years one of our technologists has been engaged in the development of methods for home or noncommercial canning of fish. Several publications, described in previous annual reports of this Division, have been published by the Bureau on this subject. The work on this project has now been completed and a final report has been prepared for publication. This report will include recommended methods of canning many fishery products not discussed in previous publications on the subject. These methods are designed primarily for the housewife or for the canning of fish in small quantities in the home, and cover enough species of fish so that all sections of this country where fish are taken may benefit from the results of this work. The species of fish and shellfish for which home canning methods have been developed, are: Alewives, herring, alewife or river herring roe, carp, suckers, fish roe, mackerel, lake trout, whitefish, mullet, mackerel (ready cooked salt-mackerel style), smoked mackerel and mullet, salmon, shad, spiced fish, king mackerel, mackerel and swordfish (tuna style), whiting, whole clams, minced clams, oysters, Atlantic and Gulf coast crab, Dungeness or Pacific coast crab, devilled crab, crab gumbo, crab soup (Norfolk style), shrimp (wet-pack method), fish chowder, New England clam chowder, and Manhattan or Coney Island clam chowder.

Studies on the canning of the blue crab were continued, with the preparation of experimental packs under commercial conditions and on a semicommercial scale. Other experimental packs were made to confirm conclusions reached in the work of the previous year. Examination of these packs of crab meat showed no deterioration or discoloration after a storage of as much as 18 months. We expect to publish the results of this work during the coming year.

As has been discussed in the annual reports of this Division in recent years, there has been a considerable demand from the various commercial fish-canning industries of the United States for a comprehensive manual describing existing methods of canning fish and shellfish in the United States, thus bringing this information up-to-date with any recommendations for improvements that a technical survey might reveal. Surveys of the fish-canning industries of the South Atlantic and Gulf of Mexico areas, and of the Pacific coast, were made during 1938; thus completing the study for the whole country. A full report covering the information obtained in this Nation-wide survey, showing cannery plans, illustrations, and other useful information, is almost finished and will be ready for publication in the near future.

In addition to the above-mentioned investigations in the canning of fishery products for the home and in commercial operations, interest in the Bureau's work in this field has been stimulated to the point that we have had to supply a rather complete technological consulting service to the industry on the various technical problems in fish canning.

### BACTERIOLOGICAL STUDIES

During 1938 the need for expanding our facilities for bacteriological research became acute and, as indicated earlier in this report, the Bureau established at College Park, Md., a new bacteriological laboratory in additional space provided free of charge by the University of Maryland in its Horticultural Building on the same floor and across the hall from space now occupied by the Bureau's other technological laboratories. The separation of the bacteriological laboratory unit from the chemical laboratory has been of considerable help in furthering the work of this unit.

### STUDIES OF ULTRAVIOLET RAYS IN KILLING BACTERIA

This project was begun late in 1937 and a part of it has been completed. Results on the completed portion are described in Investigational Report No. 43, "Some Effects of Ultraviolet Irradiation of Haddock Fillets," published by the Bureau. According to the conclusions in this paper, irradiation of haddock fillets for a period of 2 minutes produced definite bactericidal effect, and irradiation for a period of 2 hours was found to increase the vitamin D potency of the fillets. Further tests are being conducted to determine the extent to which this process may be applicable on a commercial scale by experiments on more species of fish under varying conditions and periods of irradiation.

### STUDIES IN THE HANDLING OF FRESH OYSTERS

As stated in last year's Divisional report, the purpose of this investigation is to develop and recommend improved methods for handling fresh oysters. When oysters are first shucked, the pH is nearly 7.0, indicating a neutral reaction of the flesh. During the first few days of storage, the pH rapidly decreases until a point of approximately 6.10 is reached. It then decreases much more slowly until it reaches a pH of 4.50. Below this point oysters become so sour that they are unfit for food. During this same period of change in the pH, the bacterial count declines to a minimum, after which it begins to rise rapidly as a result of the increased acidity of the oysters. The experiments also show that the bacterial flora changes with the acidity of the oysters. It was further found that excessive washing of the oysters with fresh water caused a loss of mineral content, in some cases from 1.50 percent to 0.18 percent.

## STUDIES OF METHODS OF PREPARING CRAB MEAT

At the request of a group of crab-meat packers, funds were provided to this Bureau by Congress, effective July 1, 1938, for the purpose of making a chemical and bacteriological investigation of existing methods of preparing crab meat, in the hope that improvements in such methods could be recommended to the industry. The 6 months which have been devoted to this survey have been concerned largely with the bacteriological phases of the problem. Following a survey of equipment and methods used by the packers of crab meat in the Chesapeake Bay area, a temporary field laboratory was established at Crisfield, Md., in which bacteriological and chemical examinations of commercial samples of prepared crab meat were made for the purpose of making definite recommendations designed to improve handling practices.

As a result of a thorough study of the methods employed by the various crab-packing plants, several recommendations were made to the packers which should result in definite improvement of the product. A detailed report on the results obtained thus far in this investigation has been prepared and will be published in the near future.

## PHARMACOLOGICAL STUDIES

As more has become known in recent years concerning the importance and significance of fishery products in the diet of man and his domestic animals, there has been an increasing demand for knowledge concerning the physiological effects of the different constituents of fishery products under the varying conditions under which they are manufactured and included in man's diet or in the rations of livestock. This particularly involves the metabolism of mineral constituents such as copper, arsenic, and fluorine. It also concerns studies of possible toxicity of products such as fish meal when improperly manufactured, or when decomposed due to careless conditions of handling after manufacture and before reaching the feed manufacturer or ultimate consumer.

### CHEMICAL AND PHARMACOLOGICAL STUDIES OF THE FLUORINE IN FISHERY PRODUCTS

As stated in the 1937 report of this Division, a high content of fluorine in the diet has been responsible for mottled enamel of teeth in both man and domestic animals. In cases where this difficulty has been particularly noticeable, the fluorine has been traced to mineral mixtures of inorganic origin incorporated in the diet. However, as a result of this difficulty, there has been a demand for more knowledge concerning the fluorine content of such food products as meat and fish and the physiological effect of fluorine from a natural food source as compared with fluorine of inorganic origin. Because of this situation, our technologists, in 1937, began chemical and pharmacological studies of fluorine in fishery products. Our work thus far has been confined to canned salmon and canned mackerel. Chemical analyses of the samples used in the tests showed a content of 5.8 parts per million of fluorine in the salmon on a fresh basis and 27 parts per million of fluorine in the mackerel under similar conditions. These samples, supplemented only by vitamin concentrates, were fed as the diet of albino rats in the Bureau's laboratories. No gross toxic effects were observed in any of the rats fed either species of fish during a test period of 12 weeks. However, an examination of the teeth of the experimental animals with a low power lens at the close of the test showed that the rats receiving the mackerel had developed fine white striations across the normal yellow of the enamel. None of the rats receiving the salmon showed any effects of striations and in no case was there any structural defect or abnormal growth of the teeth noted.

Analyses of the carcasses of the rats showed a close correlation between the amount of flourine ingested in the food and the amount stored in the body of the rat. Whether the source of fluorine was mackerel or salmon, approximately 20 percent of the ingested fluorine was stored in the body of the animal in most cases. The average amount of fluorine in the bodies of the rats at the close of the test was slightly over 18 parts per million for the groups fed salmon, and about 74 parts per million for those fed mackerel. The data show an inverse correlation between rat weight and the unit level of fluorine (in terms of parts per million). This was most marked where the variation in weight of the rats, within a group at the close of the test, was large. In other words, when the food intake and the rate of growth were below normal, a higher than normal percentage of the ingested fluorine was stored, and vice versa. These statistical or mathematical ratios, along with more detailed data, will be presented in a separate report to be published in the near future. However, it is well to point out here that, at the low levels of percentages of fluorine fed in the diet, a much higher percentage of the fluorine of inorganic origin added to the diet of the rat was stored in its body than was the case with the fluorine of inorganic origin.

## POSSIBLE TOXIC PROPERTIES OF CERTAIN FISH MEALS

Fish meals, as now produced on a commercial scale in the United States, are manufactured under a great variety of conditions and, therefore, differ considerably in composition and quality. These variations are due to differences in chemical composition and relative freshness of the raw material from which the fish meal is made, differences in methods of manufacture and equipment used, and differences in conditions of handling, storage, and shipment. Furthermore, fish scrap or meal was originally produced in this country primarily for use as an ingredient of commercial fertilizers, and it has only been in recent years that the major portion of it has been used as an ingredient of mixed feeds and of livestock rations. Therefore, the transition of the industry from the old methods of processing, suitable for a product of a fertilizer grade, to improved methods of manufacture necessary to produce feed concentrates of quality has naturally been a gradual one. Consequently, in a situation as described above, Federal and State regulatory feed officials and chemists have encountered quite a problem in the equitable judging of quality of fish meals in connection with the administration of feed laws. Likewise, feed manufacturers have expressed a desire for sufficient information to determine when a fish meal is suitable for animal feeding and when it is only of fertilizer grade. Since decomposition or spoilage of any food or feed product is a progressive change and a relative term, and since it is well known that some types of decomposition are not objectionable or harmful, there was a considerable demand from both producing and consuming industries interested in fish meal that the Bureau's technologists investigate the possible toxic properties of fish meals prepared from partially decomposed fish or under other adverse conditions of manufacture, handling, or storage.

Therefore, during 1938, chemical and pharmacological studies were inaugurated on this project. The fish meals used in these tests were menhaden, California sardine or pilchard, and so-called white fish meal prepared from trimmings of cod, haddock, and other ground fish. Good commercial meals of varying quality and experimentally spoiled meals were fed to groups of albino rats and baby chicks. There were no significant differences in gains in weight and food intakes of rats fed the commercial and the spoiled meals. Groups of chicks fed the spoiled meal in an otherwise purified diet generally grew faster and had a decreased mortality rate over groups fed the commercial meals. Apparently, conditions in the spoiled fish meals favored the bacterial synthesis of vitamin K and possibly of other vitamins required by the chicks. Data thus far indicate that the spoiled fish meal can be used to advantage as a protein supplement in any ration adequately balanced in vitamins and minerals.

## MANUFACTURE OF FISHERY BYPRODUCTS

Studies in this field cover the utilization of the various byproducts of the fisheries and methods for testing and improving their quality.

### UTILIZATION OF SALMON CANNERY TRIMMINGS

For the past several years the Bureau has devoted a portion of its technological activities to a study of the problem of utilizing salmon cannery waste. During this time a rather complete survey has been made regarding the nature and the composition of salmon waste, information has been obtained which fully demonstrated the value of salmon oils as sources of vitamins A and D, data have been obtained on the varied chemical and physical properties of these oils which may be expected to elucidate their utility in technical consumption, and assistance has been given the industry in developing an edible oil which can be added to the canned product. This line of attack has been followed because it was believed a better understanding of the nature and potential utility of salmon waste and the products available therefrom would stimulate a natural expansion in utilization.

However, due to the varied economic and technical obstacles prevailing throughout the salmon-canning industry, the general line of study outlined above could not be expected to be of definite help in all situations. Also, increasing utilization of waste material for the manufacture of edible canning oil has led to new problems regarding the best methods of converting the unused waste portions into their most valuable state. Therefore, after having provided a general background, attention is being directed to the development of methods which can be used in meeting specific situations prevailing in the industry.

During 1938 studies have been made on the suitability of small-unit rendering equipment for small canneries not producing enough waste to warrant installation of standard fish-meal and oil machinery. Attention has been given to the response of salmon waste to dry rendering and the conditions necessary to retain the natural properties of the rendered oil. Studies have been undertaken regarding the preparation of dehydrated protein concentrates which would also serve as vitamin A and D concentrates.

In considering conditions where huge quantities of waste are accumulated during an extremely short operating period and where a reduction plant of large capacity would have to be idle over 10 months out of a year, studies have been undertaken regarding methods of chemical preservation and chemical treatment for conversion into entirely different type products which could be prepared with a minimum of equipment. However, because of the limited period during which salmon waste representative of commercial operations can be obtained, the data from these more specialized studies are as yet incomplete and no conclusions can be drawn. The last of a series of papers covering the general aspects of salmon byproducts has been published. This report is entitled, Investigational Report No. 40, "Pacific Salmon Oils."

The results show that the waste material or cannery trimmings of chinook salmon will yield between 30 and 40 gallons of oil per ton; Alaska and coho salmon, from 25 to 35 gallons; pink salmon trimmings, from 15 to 25 gallons; and chum salmon waste, from 10 to 15 gallons. Since between 80 and 90 percent of the total catch of salmon is canned and thus most of the waste material consisting of heads, tail portions, fins, and visceral organs are accumulated in connection with cannery operations, it can be readily seen that there is a large supply of waste material in the salmon canning industry from which oil may be manufactured. The survey further shows that about 30 percent of the round weight of chinook salmon is waste material, about 33 percent of Alaska red, coho, and chum salmon, and about 35 percent of pink salmon constitute waste material from which byproducts may be made. This report also contains tables showing the chemical and physical characteristics and properties of salmon oils such as iodine number, refractive index, specific gravity, etc. This information is of value in determining commercial uses for which the oils are best suited.

## STUDIES ON THE PEROXIDE TEST AS A MEASURE OF OXIDATIVE DETERIORATION OF FISH OIL

Oxidative deterioration of fatty fish is a gradual process which eventually manifests itself in rancid odors and flavors readily detected by organoleptic means. When such a condition has been reached, the product is definitely of poorer quality and less desirable as food. In investigations on fish spoilage, the preservation of fish by various methods, and in commercial handling of fish, it is highly desirable to have some measure of the progress of oxidative deterioration prior to the development of rancid flavors and odors, since the problem of marketing is to get a product into consumption before the odor and flavor is definitely affected.

Because of the importance of this problem to all food industries, numerous methods have been proposed for measuring or following the progress of incipient rancidity. One of the most popular tests is that predicated upon the assumption that peroxides are formed as an intermediate step in the development of rancid products and such peroxide compounds break down in the presence of potassium iodide with the liberation of iodine, which can be easily measured. However, when the test, as prescribed for other fatty materials, is applied to highly unsaturated fish oils, the results obtained are not entirely satisfactory. Data are frequently inconsistent and the values obtained appear to be affected by a number of factors which tend to decrease the sensitivity of measurement. In spite of these drawbacks, the method has considerable merit on account of its simplicity, the speed with which determinations can be made, and the fact that no complicated or expensive apparatus is required. Therefore, an investigation was undertaken to determine the possibility of improving the peroxide test so that it could be used as a more reliable tool in investigating oxidative deterioration in fishery products. The progress of the work so far has been most encouraging. Numerous conditions of the reactions have been investigated and a modified procedure has been devised whereby a number of the drawbacks of other procedures are eliminated. The test, however, must be subjected to more rigorous examination before definite conclusions can be made. Should these studies result in a more effective measure of incipient rancidity, future investigations, both scientific and practical, on the handling and preservation of fatty fish will be greatly facilitated.

## UTILIZATION OF FISH LIVERS AND VISCERAL ORGANS

The sustained commercial interest in sources of concentrated vitamins A and D has led to increasing demands upon the Bureau for information regarding the utilization of fish livers and visceral organs. In recent reports reference has been made regarding the development of methods for extracting oil or vitamins from various types of material which would not respond to normal treatment. As a result of the data obtained, the Bureau's technologists have been able to advise with the industry on extraction problems and have contributed materially to the expansion in vitamin oil manufacture.

During the past year attention has been directed to a general survey of the potential value of the liver and viscera from all types of food fish taken on the Pacific coast. Analyses for oil content and vitamin A potency have been made on periodic samples involving 22 different species of fish. The oil content of the livers from the species examined ranged from 1.5 to 35 percent and the vitamin A potency of the extracted oil varied from 6,000 to 380,000 units per gram. Viscera less liver and stomachs ranged in oil content from 0.3 to 45.3 percent and yielded oils having vitamin A potencies ranging from 4,500 to 450,000 units per gram. The data will be summarized for publication when the survey is completed.

## PREPARATION OF FISH MEALS OF IMPROVED NUTRITIONAL VALUE

The Bureau's interest in fish meal in animal feeding pertains to both terrestial and aquatic animals. During the year technologists of the Division have continued to cooperate with the Department of Poultry

Husbandry at the State College of Washington, the Bureau's Division of Fish Culture, and the School of Fisheries at the University of Washington.

Studies carried on by the Division of Fish Culture and the University of Washington in recent years have resulted in the preparation of a fish meal especially suitable for fish feeding. During the year technologists of the Division of Fishery Industries have cooperated in production studies in order to clarify the steps in preparation responsible for the improved nutritional properties and to determine means of obtaining the same feeding effectiveness by a simpler process of manufacture. The results indicate that the preservation of water-soluble, heat-sensitive extractives contributes to the improved feeding properties and this can be accomplished in simple dry rendering equipment operating under reduced pressure. The studies are being repeated, since the final conclusions may provide the basis for future fish-food plants to be installed by the Bureau and other agencies engaged in fish-cultural work.

### STUDIES ON FAT IN FISH MEAL

This project was begun in 1937 and consists of collaborative work of various Government laboratories in the development and gradual improvement of methods of analysis sponsored and coordinated by the Association of Official Agricultural Chemists. Specifically, present studies involve methods of determining oil or fat in fish meal more accurately than existing methods permit. A progress report on the work was prepared and presented at the annual meeting of the Association of Official Agricultural Chemists in November 1938. The accuracy and efficiency of various chemical or organic solvents for determining the amount of oil or fat in fish-meal samples by solvent extraction were tested. Thus, this report contains a table showing the percentages of oil extracted by the various solvent reagents under differing conditions. These figures are of interest to the analytical chemist in determining the comparative accuracy of these solvents in making analyses of this kind.

### CHEMICAL PRESERVATION OF FISH AND FISH WASTE

As described in the 1937 annual report of this Division, this project was established by the Bureau as a cooperative arrangement with the Aquacide Co., Washington, D. C., and the studies are being conducted by research associates employed by that company and stationed in the Bureau's laboratories. The work consists in the development and application of chemical compounds for preserving fish livers, cannery trimmings, scrap and other fish waste, either temporarily until these materials can be transported to a central point for further mechanical processing or reduction, or as a permanent preservative in a few instances. Most of the work in 1938 was devoted to the application of a chemical solution, developed by this company, to the preservation of dogfish livers landed at isolated points for subsequent shipment to central fish-oil rendering plants.

About 1,500 barrels of dogfish livers were preserved by treatment with a formaldehyde-soda-ash compound, and, at the end of 9 months of storage, were found to be in good condition. The treated livers were then extracted and the oil was still in good condition, containing approximately 2,000 international units of vitamin A per gram. However, this oil was too low in vitamin D content to be considered as a commercial source of this vitamin.

## NUTRITIVE VALUE OF AQUATIC PRODUCTS

This has always been an important phase of our technological investigations because the relative nutritive value of the finished product is in most instances the true yardstick or measure of the value of a new method of processing or an improvement in existing methods in the industry For example, assuming that costs of production are equal in each case, if a new method of manufacturing fish meal, or a new method of freezing fish fillets, produces a finished product of better quality measured in terms of food value, then that is a true estimate of its worth or justification for its commercial application.

## MINERAL CONSTITUENTS OF FISHERY PRODUCTS

In recent years, members of our technological staff have been making a detailed study of the mineral content of some of the more important commercial species of fish and shellfish. Although this work was interrupted by resignation of personnel, it is now completed and detailed data on the calcium, phosphorus, magnesium, iron, copper, and iodine content of the edible portion of various species of fish and shellfish have been published in Investigational Report No. 41, entitled "The Mineral Content of the Edible Portions of Some American Fishery Products." Fish fillets are about equal to the muscle cuts of beef in mineral content, except that the fish greatly exceeds the meat in iodine content. Canned salmon contains about 15 times as much calcium, almost twice as much phosphorus, 20 times as much iodine, and approximately equal quantities of other minerals as beef round. Oysters, shrimp, and crab meat contain approximately half as much calcium, more than five times as much magnesium, and more phosphorus than an equal quantity of milk. In addition, these shellfish are a particularly good source of iron, copper, and iodine.

## CHEMICAL COMPOSITION AND NUTRITIVE VALUE OF FISH PROTEINS

This study, begun several years ago, has now been completed. A report of the results of one phase of the project has been published in the scientific journal, Food Research, 1938, Volume 3, No. 5, under the title of "Nutritive Value for Growth of Some Proteins of Fishery Products." By using an arbitrary factor of 100, the proteins of the following fish and shellfish fell into groups according to relative growth-promoting value, as compared to beef at a factor of 63: Oyster 100; pilchard, red snapper, shrimp and Boston mackerel 90; and shad, cod, croaker, and silver salmon 80.

The chemical determinations of the principal amino acids in the proteins of several species of fish and shellfish have also been completed and a report is now being prepared for publication. Arginine, histidine, and lysine were determined in the proteins of 20 species of fish and shellfish as follows: Cod, croaker, haddock, halibut, sea herring, lake trout, Boston mackerel, Spanish mackerel, mullet, pilchard, red snapper, chum salmon, king salmon, silver salmon, shad, squeteague, hard clam, blue crab, oyster, and shrimp. Tryptophane was determined in the proteins of 28 species as follows: Catfish, cod, croaker haddock, halibut, lake herring, sea herring lake trout, Boston mackerel, Spanish mackerel, mullet, pilchard, red snapper, chum salmon, king salmon, pink salmon, silver salmon, sockeye salmon, shad, squeteague, albacore tuna, bluefin tuna, bonito, skipjack, hard clam, blue crab, oyster, and shrimp. Cystine was determined in the proteins of the following 13 species: Cod, croaker, haddock, halibut, Boston mackerel, Spanish mackerel, mullet, red snapper, king salmon, pink salmon, silver salmon, shad, and shrimp.

### VITAMIN CONTENT OF FISHERY PRODUCTS

The only work done on this subject in 1938 was a series of assays of the vitamin D content of experimentally prepared fish-liver oils forwarded by our Seattle laboratory, in connection with its byproducts studies, to our nutrition laboratory at College Park. These determinations were used as a method of evaluating various methods of handling and extracting fish livers and are discussed in Investigational Report No. 40, entitled "Pacific Salmon Oils," previously discussed in this report.

### SODIUM ALGINATE AS A STABILIZER IN PRODUCTS OF THE DAIRY INDUSTRY

Sodium alginate is a very useful preparation produced from the giant kelp (*Macrocystis pyrifera*) harvested from waters on the Pacific coast. It is used extensively as a stabilizer in such dairy products as chocolate milk, ice cream, etc. The results have been very satisfactory to the dairy industry from the mechanical standpoint, but regulatory authorities have expressed a desire to learn whether sodium alginate has any toxic properties. Accordingly, two commercial samples of sodium alginate were used in feeding tests with experimental animals and were tested in the diet in percentages much higher than would be used as a stabilizer in dairy products. The results of these experiments showed no indications whatsoever of any toxicity of the sodium alginate. The detailed conclusions of this study have been assembled in a report.

### KELP MEAL IN ANIMAL FEEDING

This project was inaugurated several years ago by the Dairy Department of the University of Maryland and of the Maryland State Agricultural Experiment Station at College Park, Md., in cooperation with our technologists, to determine whether kelp meal, as a mineral supplement, had value in improving reproduction in dairy cattle. The tests thus far have been conducted with heifers and the preliminary results have been very encouraging. The study is being continued with producing or lactating dairy cows on a more extensive scale and it is hoped that information of considerable interest and benefit to the dairy industry will result from these experiments. Tests of this kind with large farm animals, such as dairy cows, require several years for the production of conclusive results. However, quite definite improvement in the reproductive record of the animals fed kelp meal has resulted thus far.

## RESEARCH ASSOCIATES AND STUDENT ASSISTANTS

Because of the relatively small size of the Bureau's technological staff, and the rather broad field of research it must cover, it is only possible to undertake those problems which are of a fundamental nature and which promise to be of the greatest value to the largest number of persons, whose livelihood depends in whole or in part on the fisheries, and which are possible with the funds and personnel available. For this reason the Division cannot, with present facilities, attack problems of special or restricted interest affecting certain products, processes, methods, or industries. However, the Bureau has available, by congressional authorization and under an arrangement similar to that of other scientific Government bureaus, facilities for research associates and student assistants in its laboratories. The salaries and expenses of these employees are paid by the firms or groups who are interested in the problems on which they are working and the investigations are carried out under the supervision of the Bureau's technologists in its laboratories and under its control. Thus the Bureau provides these industries and groups with laboratory, consulting, and library facilities which, in most instances, cannot be obtained elsewhere.

Within the limits of its facilities, the Bureau also has opened its technological laboratories to research students who are pursuing courses in universities and who are selecting investigational problems in the fisheries as their major study. This may prove of special benefit to the industry as it brings its problems to the attention of a large group of research workers who in turn may spread interest to applied fishery research.

In the preceding sections of this report we have given the names of organizations which are conducting cooperative projects under the supervision of our technological staff and which have employed research associates for this purpose. In the preceding section on laboratories, we have given the individual names of these research associates and student assistants. The plan of utilizing graduate student assistants for working part-time on research projects has been so successful that the University of Maryland employed from its own funds additional graduate students, by establishing two research fellowships for work on fishery technological research. Some of these new research problems assigned to these research fellows at the beginning of the school year in October 1938, are: (1) Studies on the enzymes in fresh and frozen fish; (2) chemical and pharmacological studies on the oxidized oils in fish meals; (3) chemical and pharmacological studies on the decomposition of protein in fish meals; and (4) studies of certain bacterial enzymes responsible for certain types of fish spoilage. These projects are selected by the student in accordance with his qualifications, approved by both the Bureau and the University, and the results are prepared in a thesis submitted for a master's or a doctor's degree at the end of 3 years of part-time work. These students usually do excellent work, the results of such studies are usually of value to the industry, and this plan serves to educate and train scientific fishery investigators.

## EDUCATIONAL AND CONSULTING SERVICE

In addition to the research activities described in this report, our economic and technological staffs conduct, along with their regular duties, an educational and consulting service for those interested in the fisheries. During the past year the demand for this type of service has increased. Many requests have been received from groups and individuals to demonstrate improved methods developed in our laboratories for the handling and processing of fishery products, for instruction in fish cookery, and for aid in improving various marketing practices. Insofar as our facilities have permitted, we have complied with these requests, endeavoring to offer assistance especially where the request has come from a large group or industry. However, we have not been able to comply with all of the requests received because of insufficient personnel and because of inadequate funds to provide for the travel expenses of the demonstrators.

Some of the educational services rendered are discussed or referred to in previous paragraphs of this report. In brief, this work has covered the fields of commercial preserving of fishery products, fish cookery in the home, and the marketing of aquatic products.

Another phase of this service has consisted of answering thousands of letters directed to the Bureau on fishery subjects and of supplying information to persons who have called at the Bureau personally. Many of the latter came from foreign lands to seek fishery information which might be useful in the conduct of the industry in their native country.

## PUBLICATIONS OF THE DIVISION

During the calendar year 1938 the following publications were prepared and addresses delivered by members of the Division's staff. These do not include the monthly statistical bulletins of the landings of fishery products at Boston and Gloucester, Mass., Portland, Maine, and Seattle, Wash., nor the monthly reports on cold-storage holdings of frozen fish and quantities of fish frozen. The fishery reports and circulars may be purchased, at the prices shown, from the Superintendent of Documents, Government Printing Office, Washington, D. C. The statistical bulletins and special or S–memoranda are distributed free of charge upon request to the Bureau. The special articles may be obtained from the sources of publication.

Those wishing to receive copies of this report and statistical bulletins as issued should request that their names be placed on the Bureau's mailing lists, Nos. 128 for the annual statistical report; 128a for general statistical bulletins; 128b for monthly cold-storage reports; and 128d for periodic fishery market news reports. Those desiring daily fishery market news reports from any one of the Division's Fishery Market News offices which have been established should apply direct to the Bureau of Fisheries, Division of Fishery Industries, Fishery Market News Service at the nearest of the following five addresses: 33A Fulton Street, New York, N. Y.; 253½ Northern Avenue, Boston, Mass.; 200 North Jefferson Street, Chicago, Ill.; 309 Duval Building, Jacksonville, Fla.; or 421 Bell Street Terminal, Seattle, Wash. For historical statistical data on the domestic fisheries for the period 1880 to 1929 consult the report entitled "Fishery Industries of the United States, 1930," by R. H. Fiedler, appendix II to the report of the United States Commissioner of Fisheries for the fiscal year 1931. Statistical information for the years 1930 to 1936, inclusive, may be obtained from the annual reports of the Division for the years 1931 to 1937, inclusive.

### DOCUMENTS, REPORTS, AND CIRCULARS

DeLoach, Barton.
  Trade in fresh and frozen fishery products and related marketing considerations in the San Francisco Bay area. 8°, 51 pp. Investigational Report No. 39. 10 cents.

Fiedler, R. H.
  Fishery industries of the United States, 1937. 8°, 460 pp. Administrative Report No. 32. Appendix III to Report of Commissioner of Fisheries, 1938. 25 cents.

Johnson, Fred F.
  Marketing of shad on the Atlantic coast. 8°, 44 pp. Investigational Report No. 38. 10 cents.

### SPECIAL ARTICLES AND ADDRESSES

Fiedler, R. H.
  Fishing industry—chart your course. Bureau of Fisheries' Memorandum S–347, Washington, D. C., also published in Pacific Coast News, Vancouver, B. C., in issue of December 15, 1938, as "Dry" statistics tell history of fishing industry.
  Review of the fishery industry. Address before National Fisheries Convention, Boston, Mass., October 6, 1938. In minutes of National Fisheries Convention and Exposition, October 6–9, 1938, Massachusetts Fisheries Assoc., Boston, Mass.

Harrison, Roger W.
  The addition of oil to canned salmon. Address before Sixth Annual Canned Salmon Cutting Demonstration, March 11, 1938, Seattle, Wash.; also mimeographed by Northwest Branch, National Canners Association. Seattle, Wash.
  Report on fat in fish meal. Journal of Association of Official Agricultural Chemists, vol. XXI, No. 4, pp. 618–621, November 1938. Washington, D. C.
  Fat in fish meal. Address before the Feedstuffs Section of the Association of Official Agricultural Chemists, November 15, 1938. Washington, D. C.
  Developments in the field of byproducts. 1938 Annual Review Number, Fishing Gazette, pp. 62–63 and 109. New York, N. Y.

Jarvis, Norman D.
  The canning of herring (alewives) and herring roe. Address before Ridge Fishermen's Cooperative, February 10, 1938. Ridge, Md.
  Home canning of Maine fish and sea foods. Canning demonstration and address at the Rural Women's Short Course, University of Maine, March 31, 1938. Orono, Maine.
  Smoking Maryland fish at home. Demonstration and address at the Women's Short Course, University of Maryland, June 16, 1938. College Park, Md.
  Home canning of Maryland fish and sea foods. Canning demonstration and address at the Women's Short Course, University of Maryland, June 17, 1938. College Park, Md.
  Fish and shell fish canapes and hors d'oeuvres. Bureau of Fisheries' Special Memorandum 3219–A. Washington, D. C.

Johnson, Fred F.
  Species of fish and shellfish of principal importance in the retail trade of certain cities. Bureau of Fisheries' Memorandum S–346. Washington, D. C.

Lanham, William B. Jr., and James M. Lemon
  Nutritive value for growth of some proteins of fishery products. Bureau of Fisheries' Special Memorandum 2195–C. Washington, D. C. Reprinted from Food Research, vol. 3, No. 5, 1938. Champaign, Ill.

LEMON, J. M.

Refrigeration—A great development in the fishing industry. Ice and Refrigeration, vol. 94, No. 2, p. 98, February 1938. Chicago, Ill.

Technological research in the oyster industry. Address before the Oyster Institute of North America, June 6, 1938. Providence, R. I.

The relation of technological research to the fisheries. Address before seminar of graduate students in bacteriology, University of Maryland, October 6, 1938. College Park, Md.

Selection and handling frozen fish for the hotel and restaurant trade. Address before the Southeastern Section of the Hotel and Restaurant Managers Association at the Mayflower Hotel, December 7, 1938. Washington, D. C.

Sea food refrigeration comes of age. 1938 Annual Review Number, Fishing Gazette, vol. 55, No. 10, pp. 80–82. New York, N. Y.

LEMON, JAMES M., and C. E. SWIFT.

The effect of oat flour as an anti-oxidant in frozen fatty fish. Paper prepared for the American Chemical Society, September 8, 1938. Milwaukee, Wis. Abstracted in Fishing Gazette, vol. 55, No. 12, pp. 13–30, November 1938. New York, N. Y.

MANNING, J. R.

What technology is doing for the fish industry. Bureau of Fisheries' Special Memorandum 3509. Washington, D. C. Reprinted from Food Industries, April 1938. New York, N. Y.

Fishery technology today. Address before local branch of the American Chemical Society, April 19, 1938. Penns Grove, N. J.

Scientists must achieve the power of expression. Lecture to seminar of graduate students in bacteriology, University of Maryland, October 19, 1938. College Park, Md.

Problems of technical supervision in the Government service. Lecture to Colgate University student group at Brookings Institution, October 26, 1938. Washington, D. C.

Relation of technological investigations of the Bureau of Fisheries to chemical work of the Bureau of Customs. Address before the annual conference or meeting of chief chemists of field laboratories of the Bureau of Customs, Treasury Department, November 16, 1938. Washington, D. C.

Report on fish meal before Association of American Feed Control Officials on November 17, 1938. Washington, D. C.

STANSBY, MAURICE E.

Simple electrode support for electrometric titrations. Industrial and Engineering Chemistry, Analytical Edition, vol. 10, No. 9, p. 529, September 15, 1938. Easton, Pa.

## STATISTICAL BULLETINS

Fisheries of the Chesapeake Bay States, 1936. Statistical Bulletin No. 1259.

Fisheries of the South Atlantic and Gulf States, 1936. Statistical Bulletin No. 1264.

Fisheries of the Pacific Coast States, 1936. Statistical Bulletin No. 1279.

Lake fisheries, 1935. Statistical Bulletin No. 1275.

Lake fisheries, 1936. Statistical Bulletin No. 1278.

Fisheries of the United States and Alaska. Statistical Bulletin No. 1280.

Manufactured fishery products of the United States and Alaska. Statistical Bulletin No. 1282.

Fishery products frozen and cold-storage holdings of frozen and cured fishery products in the United States and Alaska, 1937. Statistical Bulletin No. 1267.

Production of fresh and frozen packaged fish in the United States, 1937. Statistical Bulletin No. 1293.

Canned fishery products and byproducts of the United States and Alaska, 1937. Statistical Bulletin No. 1289.

Fisheries of Alaska, 1937. Statistical Bulletin No. 1285.

Landings by fishing vessels at the three principal New England ports, 1937—by months. Statistical Bulletin No. 1263.

Landings by fishing vessels at the three principal New England ports, 1937—by gear and fishing grounds. Statistical Bulletin No. 1269.

Fishery products landed by United States vessels at Seattle, Wash., 1937. Statistical Bulletin No. 1270.

## Part 2. FISHERY STATISTICS, 1937

### GENERAL REVIEW

Available statistics indicate that there was a decrease in the volume but an increase in the value of fishery products taken in the United States and Alaska during 1937, as compared with the preceding year. Data on the catch were collected for both 1936 and 1937 in the Chesapeake, South Atlantic and Gulf, Pacific, and Lake States, and in Alaska. The combined catch in these sections alone shows a decrease of 13 percent in volume but an increase of 7 percent in value. Decreased catches were made in each of the five geographical sections; however, the principal reductions occurred in the Pacific Coast States where greatly reduced catches of pilchards were taken, and in Alaska where there was a large decline in the catch of salmon. The value of the production of canned fishery products in all sections increased 11 percent as compared with 1936; byproducts increased 5 percent; frozen fish about 1 percent; and packaged fish 3 percent.

The total catch of fishery products in the United States and Alaska, as based on the most recent surveys, amounted to 4,352,549,000 pounds, valued at $100,845,000. About 130,000 fishermen were employed in making this catch.

The production of canned fishery products in the United States and Alaska during 1937 amounted to 742,197,065 pounds, valued at $105,174,935; the output of byproducts was valued at $36,804,045; the production of frozen fishery products, excluding packaged products, amounted to 103,111.549 pounds, estimated to be valued at $8,800,000; and fresh and frozen packaged fish and shellfish, 201,802,529 pounds, valued at $27,677,899. Based on surveys for 1937 in all sections except the Mississippi River area, and for 1931 in that area, the production of cured fishery products amounted to 104,339,340 pounds, valued at $15,635,280. It is estimated that about 686,000,000 pounds of fresh fishery products (excluding packaged fish and shellfish) valued at about $57,000,000, were marketed during 1937. The total marketed value to domestic primary handlers of all fishery products in 1937 is estimated at $251,000,000.

Fishery products imported for consumption were valued at $50,635,515 and domestic exports were valued at $14,567,252.

*New England States.*—In 1937 the commercial catch of fishery products in these States showed an increase in both volume and value as compared with 1935, when the first preceding survey of the total catch of these States was made. The yield of the fisheries in this section during 1937 was the largest that has been recorded, with the exception of the catch for the years of 1929 and 1930.

A comparison of the combined vessel landings at Boston and Gloucester, Mass., and Portland, Maine, which are available for both 1936 and 1937, show that those landings declined in 1937.

*Middle Atlantic States.*—The 1937 commercial catch of fishery products in the Middle Atlantic States decreased in volume but increased in value as compared with 1935, when the first preceding survey of the total catch was made. Available data for both 1936 and 1937 show that the production .of frozen fish in these States declined in 1937, while the catch of shad in the Hudson River was the largest on record since 1901.

*Chesapeake Bay States.*—In 1936 the catch of fishery products in the Chesapeake Bay States decreased in both volume and value, as compared with the previous year. The value of menhaden products, which were produced in Virginia, declined during the year, while both the quantity and value of fresh-shucked oysters, and packaged fresh-cooked crab meat increased.

*South Atlantic and Gulf States.*—The catch of fishery products in the South Atlantic and Gulf States during 1937 declined in volume but increased in value, as compared with the previous year. There was a large increase in the value of manufactured fishery products produced in these States in 1937 due to material increases in the production of packaged fresh-cooked crab meat, fresh-shucked oysters, and canned shrimp and oysters.

*Pacific Coast States.*—The commercial catch of fishery products in these States during 1937 decreased in volume, but increased in value. The decrease in volume resulted principally from reduced catches of pilchards in California. The 1937 production of canned sardines, salmon, and tuna increased as compared with 1936, while the packs of mackerel and oysters decreased. The value of fishery byproducts, which consist largely of fish meal and oil also declined.

*Lake States.*—In 1937 the commercial catch of fishery products in the Lake States decreased in both volume and value, as compared with 1936. The decreases resulted principally from reduced catches of blue pike.

*Mississippi River and tributaries.*—The most recent complete statistics of the catch of the Mississippi River and tributaries are those collected for 1931. As compared with 1922, when the most recent preceding survey was made, there was a decrease in the catch. This decrease was reflected principally in a smaller catch of fresh-water mussels. A survey made for Lakes Pepin and Keokuk, and the Mississippi River between these two lakes, for 1937 showed a decrease in the catch of fishery products in Lake Pepin and the Mississippi River between these lakes, but an increase in the catch in Lake Keokuk as compared with the previous year. The production of fresh-water mussel-shell buttons declined in 1937 as compared with 1936.

*Alaska.*—The catch of fishery products in Alaska in 1937 decreased in volume but increased in value, as compared with 1936. There was a material decline in the yield of salmon for the year, while the catches of herring and crabs increased. The production of frozen fishery products and byproducts increased in quantity and value in 1937, while the output of fresh, cured, and canned products decreased.

## *Fisheries of the United States and Alaska, 1937* [1]

### SUMMARY OF CATCH: BY SECTIONS

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Product | New England area XXII | | Middle Atlantic area XXIII | | Chesapeake area XXIII | | South Atlantic and Gulf areas XXIV and XXV | | Pacific | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Fish | 615, 167 | 13, 524 | 230, 194 | 3, 700 | 209, 484 | 2, 376 | 343, 669 | 5, 648 | 1, 553, 757 | 26, 723 |
| Shellfish, etc | 55, 697 | 6, 413 | 34, 458 | 4, 196 | 82, 761 | 3, 985 | 203, 082 | 8, 578 | 21, 982 | 2, 013 |
| Whale products | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1, 138 | 41 |
| Total | 670, 864 | 19, 937 | 264, 652 | 7, 896 | 292, 245 | 6, 361 | 546, 751 | 14, 226 | 1, 576, 877 | 28, 777 |

| Product | Lakes | | Mississippi River and tributaries | | Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Fish | 83, 105 | 6, 006 | 44, 062 | 2, 258 | 822, 724 | 14, 019 | 3, 902, 162 | 74, 254 |
| Shellfish, etc | 853 | 27 | 38, 321 | 640 | 3, 059 | 219 | 440, 213 | 26, 071 |
| Whale products | ---- | ---- | ---- | ---- | 9, 036 | 479 | 10, 174 | 520 |
| Total | 83, 958 | 6, 033 | 82, 383 | 2, 898 | 834, 819 | 14, 717 | 4, 352, 549 | 100, 845 |

NOTE.—The roman numerals appearing under the names of the sections are the numbers given these areas by the North American Council on Fishery Investigations. It should be explained that there are included under these areas craft whose principal fishing ports are in the respective areas but at times they may fish elsewhere.

### OPERATING UNITS: BY SECTIONS

| Item | New England | Middle Atlantic | Chesapeake | South Atlantic and Gulf | Pacific |
|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 5, 345 | 2, 627 | 2, 486 | 4, 322 | 9, 099 |
| On boats and shore | 14, 279 | 5, 093 | 14, 043 | 25, 922 | 12, 456 |
| Total | 19, 624 | 7, 720 | 16, 529 | 30, 244 | 21, 555 |
| Vessels: | | | | | |
| Steam | 39 | 10 | 25 | ---- | 4 |
| Net tonnage | 5, 977 | 1, 212 | 2, 833 | ---- | 96 |
| Motor | 630 | 438 | 171 | 1, 026 | 1, 213 |
| Net tonnage | 18, 330 | 7, 324 | 2, 671 | 12, 013 | 37, 050 |
| Sail | ---- | 3 | 151 | 69 | 5 |
| Net tonnage | ---- | 32 | 1, 886 | 645 | 2, 198 |
| Total vessels | 669 | 451 | 347 | 1, 095 | 1, 222 |
| Total net tonnage | 24, 307 | 8, 568 | 7, 390 | 12, 658 | 39, 344 |
| Boats: | | | | | |
| Motor | 4, 469 | 1, 504 | 6, 109 | 7, 913 | 5, 157 |
| Other | 4, 732 | 2, 261 | 4, 692 | 9, 281 | 811 |
| Accessory boats | 712 | 223 | 105 | 216 | 853 |
| Apparatus: | | | | | |
| Haul seines | 98 | 239 | 271 | 1, 186 | 227 |
| Purse seines | 103 | 44 | 36 | 48 | 598 |
| Lampara nets | ---- | ---- | ---- | ---- | 233 |
| Otter trawls | 509 | 213 | 19 | 4, 201 | 54 |
| Beam trawls | ---- | ---- | ---- | ---- | 25 |
| Paranzella nets | ---- | ---- | ---- | ---- | 14 |
| Gill nets | 6, 608 | 1, 936 | 9, 842 | 12, 257 | 3, 789 |
| Trammel and bar nets | ---- | ---- | ---- | 954 | 31 |
| Pound nets, trap nets, and weirs | 466 | 435 | 2, 388 | 3, 104 | 33 |
| Stop nets | 78 | 70 | 2 | ---- | ---- |
| Fyke nets | 247 | 1, 638 | 2, 596 | 1, 083 | 1, 989 |
| Bag nets | 155 | ---- | ---- | ---- | 9 |
| Other nets [3] | 617 | 200 | 2, 303 | 10, 060 | 532 |
| Hooks, baits, or snoods | 2, 485, 280 | 687, 489 | 2, 032, 491 | 1, 538, 766 | 1, 099, 859 |
| Fish wheels | ---- | ---- | ---- | 10 | ---- |
| Eel pots and traps | 3, 083 | 3, 364 | 11, 273 | 1, 502 | ---- |
| Brush traps | ---- | ---- | ---- | 28, 300 | ---- |
| Lobster pots and traps | 306, 130 | 23, 664 | ---- | ---- | 5, 721 |

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[1] All figures are for 1937, except those for the Mississippi River and tributaries, which are for 1931.

[3] Includes dip, push, reef, scap, drag, cast, and drop nets.

## *Fisheries of the United States and Alaska, 1937*—Continued

### OPERATING UNITS: BY SECTIONS—Continued

| Item | New England | Middle Atlantic | Chesapeake | South Atlantic and Gulf | Pacific |
|---|---|---|---|---|---|
| Apparatus—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* |
| Crab, crawfish, and turtle pots, and traps | 3, 660 | 10 | 1, 060 | 9, 381 | 29, 162 |
| Clam dredges | 112 | 121 |  | 1 |  |
| Crab dredges |  | 73 | 198 |  |  |
| Mussel dredges | 4 | 2 |  |  |  |
| Oyster dredges | 150 | 291 | 459 | 897 | 4 |
| Scallop dredges | 3, 696 | 78 | 2 | 37 |  |
| Crab scrapes |  |  | 746 |  |  |
| Tongs, rakes, shovels, hoes, forks, picks, etc | 6, 485 | 3, 947 | 8, 478 | 3, 563 | 4, 266 |
| Diving outfits |  |  |  | 72 | 24 |
| Other apparatus [5] | 1, 231 | 11, 291 | 235 | 6, 779 | 416 |

| Item | Lakes | Mississippi River and tributaries | Alaska | Total |
|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* |
| On vessels | 1, 662 |  | [2] 11, 570 | 37, 111 |
| On boats and shore | 4, 756 | 15, 884 |  | 92, 433 |
| Total | 6, 418 | 15, 884 | 11, 570 | 129, 544 |
| Vessels: |  |  |  |  |
| Steam | 49 |  | 6 | 133 |
| Net tonnage | 1, 146 |  | 488 | 11, 752 |
| Motor | 433 |  | 866 | 4, 777 |
| Net tonnage | 5, 200 |  | 11, 847 | 94, 435 |
| Sail |  |  |  | 228 |
| Net tonnage |  |  |  | 4, 761 |
| Total vessels | 482 |  | 872 | 5, 138 |
| Total net tonnage | 6, 346 |  | 12, 335 | 110, 948 |
| Boats: |  |  |  |  |
| Motor | 1, 637 | 4, 426 | 1, 692 | 32, 907 |
| Other | 1, 408 | 10, 120 | 3, 494 | 36, 799 |
| Accessory boats | 9 |  |  | 2, 118 |
| Apparatus: |  |  |  |  |
| Haul seines | 259 | 1, 013 | 209 | 3, 502 |
| Purse seines |  |  | 862 | 1, 691 |
| Lampara nets |  |  |  | 233 |
| Otter trawls |  |  |  | 4, 996 |
| Beam trawls |  |  | 13 | 38 |
| Paranzella nets |  |  |  | 14 |
| Gill nets | 162, 829 | 101 | 4, 121 | 201, 483 |
| Trammel and bar nets | 115 | 518 |  | 1, 618 |
| Pound nets, trap nets, and weirs | 10, 252 | 374 | 457 | 17, 509 |
| Stop nets |  |  |  | 150 |
| Fyke nets | 2, 800 | 32, 541 |  | 42, 894 |
| Bag nets |  |  |  | 164 |
| Other nets [3] |  | 191 |  | 13, 903 |
| Hooks, baits, or snoods | 1, 222, 970 | 2, 459, 179 | (4) | 11, 526, 034 |
| Fish wheels |  |  | 255 | 265 |
| Eel pots and traps |  |  |  | 19, 222 |
| Brush traps |  |  |  | 28, 300 |
| Lobster pots and traps |  |  |  | 335, 515 |
| Crab, crawfish, and turtle pots, and traps | 850 | 456 | 3, 479 | 48, 058 |
| Clam dredges |  |  |  | 237 |
| Crab dredges |  |  |  | 271 |
| Mussel dredges |  | 440 |  | 446 |
| Oyster dredges |  |  |  | 1, 801 |
| Scallop dredges |  |  |  | 3, 813 |
| Crab scrapes |  |  |  | 746 |
| Tongs, rakes, shovels, hoes, forks, picks, etc | 37 | 3, 994 |  | 30, 770 |
| Diving outfits |  |  |  | 96 |
| Crowfoot bars | 158 | 4, 480 |  | 4, 638 |
| Other apparatus [5] |  | 3, 781 |  | 23, 733 |

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[2] Includes persons in boats and shore fisheries.

[4] Number not determined.

[5] Includes periwinkle, cockle, and fish pots; harpoons, spears, hooks, coquina scoops, octopus and slat traps, and wire baskets.

NOTE.—The South Atlantic and Gulf section includes the fisheries of Lake Okeechobee, Fla.

## *Fisheries of the United States and Alaska, 1937*—Continued

### CATCH: By sections

[Expressed in thousands of pounds and thousands of dollars; that is 000 omitted]

| Species | New England | | Middle Atlantic | | Chesapeake | | South Atlantic and Gulf | | Pacific | |
|---|---|---|---|---|---|---|---|---|---|---|
| FISH | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Alewives | 4, 207 | 22 | 715 | 10 | 18, 883 | 188 | 6, 218 | 60 | | |
| Amberjack | | | | | | | 51 | 1 | | |
| Anchovies | 32 | (6) | | | | | | | 226 | 4 |
| Angelfish | | | | | | | 9 | (6) | | |
| Barracuda | | | | | | | | | 2, 933 | 161 |
| Black bass | | | | | 41 | 5 | | | | |
| Bluefish | 221 | 19 | 2, 348 | 170 | 609 | 30 | 5, 294 | 258 | | |
| Blue runner or hardtail | | | | | | | 784 | 9 | | |
| Bonito | 48 | 4 | 224 | 10 | 35 | 1 | 1 | (6) | | |
| Bowfin | | | | | | | 3 | (6) | | |
| Buffalofish | | | | | | | 716 | 37 | | |
| Butterfish | 2, 870 | 110 | 4, 956 | 229 | 2, 048 | 33 | 13 | (6) | | |
| Cabio or crab eater | | | | | 20 | 1 | 2 | (6) | | |
| Cabrilla | | | | | | | | | 131 | 7 |
| Carp | 41 | 3 | 508 | 36 | 633 | 22 | 324 | 7 | 163 | 5 |
| Catfish and bullheads | (6) | (6) | 115 | 6 | 1, 107 | 36 | 7, 067 | 334 | 303 | 34 |
| Cero | | | 51 | 1 | | | (6) | (6) | | |
| Cigarfish | | | | | | | 17 | (6) | | |
| Cod | 134, 605 | 2, 657 | 6, 415 | 223 | 1 | (6) | | | 12, 637 | 195 |
| Crappie | | | | | 3 | (6) | 524 | 18 | | |
| Crevalle | 2 | (6) | | | | | 196 | 4 | | |
| Croaker | 866 | 28 | 4, 236 | 71 | 34, 095 | 516 | 10, 286 | 127 | | |
| Cunner | 43 | 1 | | | | | | | | |
| Cusk | 10, 172 | 186 | 91 | 1 | | | | | | |
| Dolphin | | | | | | | 3 | (6) | | |
| Drum: | | | | | | | | | | |
| Black | | | 5 | (6) | 47 | 1 | 1, 894 | 49 | | |
| Red or redfish | 3 | (6) | 10 | (6) | 46 | 1 | 3, 221 | 164 | | |
| Eels: | | | | | | | | | | |
| Common | 404 | 35 | 478 | 41 | 317 | 28 | 104 | 3 | | |
| Conger | 63 | 1 | 32 | 1 | 1 | (6) | | | | |
| Flounders | 48, 202 | 1, 830 | 10, 876 | 604 | 530 | 28 | 997 | 64 | 16, 285 | 749 |
| Flyingfish | | | | | | | | | 42 | 2 |
| Frigate mackerel | | | 185 | 2 | | | | | | |
| Garfish | | | | | | | 6 | (6) | | |
| Gizzard shad | | | 1 | (6) | 351 | 5 | 38 | (6) | | |
| Goosefish | 37 | (6) | | | | | | | | |
| Grayfish | 32 | 1 | 58 | 1 | 5 | (6) | | | 2, 533 | 29 |
| Groupers | | | 22 | 1 | | | 5, 546 | 175 | 58 | 3 |
| Grunts | | | | | | | 59 | 1 | | |
| Haddock | 169, 487 | 4, 172 | 2, 282 | 76 | | | | | | |
| Hake | 25, 109 | 363 | 367 | 6 | 3 | (6) | | | 63 | 1 |
| Halibut | 2, 439 | 257 | 3 | (6) | | | | | 24, 418 | 2, 176 |
| Hardheads | | | | | | | | | 54 | 5 |
| Harvestfish or "starfish" | | | | | 1, 093 | 20 | 641 | 10 | | |
| Herring, sea | 53, 042 | 297 | 371 | 4 | | | | | 1, 792 | 17 |
| Herring smelt | 10 | (6) | | | | | | | | |
| Hickory shad | 13 | (6) | 2 | (6) | 113 | 2 | 230 | 7 | | |
| Hogchoker | | | | | 18 | (6) | | | | |
| Hogfish | | | | | 1 | (6) | 21 | (6) | | |
| Horse mackerel | | | | | | | | | 6, 542 | 65 |
| Jewfish | | | | | | | 85 | 3 | | |
| Kingfish (California) | | | | | | | | | 646 | 16 |
| Kingfish or "king mackerel" | | | 149 | 6 | | | 3, 359 | 124 | | |
| King whiting or "kingfish" | 15 | 1 | 150 | 4 | 143 | 4 | 1, 726 | 40 | | |
| Lamprey | 3 | (6) | | | | | | | | |
| Launce | 268 | 3 | | | | | | | | |
| "Lingcod" | | | | | | | | | 2, 731 | 101 |
| Mackerel | 23, 381 | 959 | 3, 117 | 95 | 103 | 2 | | | 60, 936 | 669 |
| Marlin | | | | | | | | | 4 | (6) |
| Menhaden | 294 | 2 | 148, 505 | 657 | 121, 980 | 485 | 211, 358 | 616 | | |
| Minnows | 2 | 1 | | | | | | | | |
| Mojarra | | | | | | | 349 | 7 | | |
| Moonfish | | | | | | | 5 | (6) | | |
| Mullet | | | 65 | 3 | 14 | (6) | 36, 210 | 1, 197 | 9 | 1 |
| Mummichog | 1 | (6) | 1 | (6) | | | | | | |
| Muttonfish | | | | | | | 233 | 14 | | |
| Paddlefish or spoonbill cat | | | | | | | 71 | 4 | | |
| Permit | | | | | | | 12 | (6) | | |
| Pigfish | | | (6) | (6) | | | 117 | 2 | | |
| Pike or pickerel | | | | | 40 | 6 | (6) | (6) | | |
| Pilchard | | | | | | | | | 1, 139, 505 | 6, 815 |

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[6] Less than 500 pounds or dollars.

*Fisheries of the United States and Alaska, 1937*—Continued

CATCH: BY SECTIONS—Continued

[Expressed in thousands of pounds and thousands of dollars; that is 000 omitted]

| Species | New England | | Middle Atlantic | | Chesapeake | | South Atlantic and Gulf | | Pacific | |
|---|---|---|---|---|---|---|---|---|---|---|
| FISH—continued | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Pinfish | | | | | | | 70 | 1 | | |
| Pollock | 37,566 | 524 | 118 | 3 | | | | | | |
| Pompano | | | (6) | (6) | 11 | 1 | 700 | 139 | 5 | 2 |
| Rock bass | | | | | | | | | 324 | 18 |
| Rockfishes | | | | | | | | | 4,889 | 214 |
| Rosefish | 58,356 | 887 | 1 | (6) | | | | | | |
| Rudderfish | | | 2 | (6) | | | | | 36 | 2 |
| Sablefish | | | | | | | | | 3,949 | 192 |
| Salmon: | | | | | | | | | | |
| Atlantic | 29 | 6 | | | | | | | | |
| Blueback, red or sockeye | | | | | | | | | 7,042 | 737 |
| Chinook or king | | | | | | | | | 35,592 | 2,867 |
| Chum or keta | | | | | | | | | 11,435 | 294 |
| Humpback or pink | | | | | | | | | 25,425 | 637 |
| Silver or coho | | | | | | | | | 16,167 | 891 |
| Sculpin | | | | | | | | | 146 | 11 |
| Scup or porgy | 10,062 | 214 | 6,752 | 135 | 1,958 | 31 | 50 | 2 | | |
| Sea bass | 2,553 | 141 | 2,639 | 154 | 213 | 10 | 394 | 21 | 714 | 40 |
| Sea bass, white (California) | | | | | | | | | 602 | 57 |
| Sea catfish | | | | | | | 272 | 7 | | |
| Sea robin | 181 | 2 | 71 | 1 | 3 | (6) | | | | |
| Shad | 445 | 27 | 4,394 | 406 | 3,491 | 313 | 1,317 | 192 | 1,214 | 46 |
| Sharks | 127 | 3 | 66 | 2 | 6 | (6) | 2,557 | 14 | | |
| Sheepshead: | | | | | | | | | | |
| Fresh-water | | | | | | | 604 | 17 | | |
| Salt-water | | | | | (6) | (6) | 1,148 | 37 | 82 | 3 |
| Silversides | (6) | (6) | | | | | | | | |
| Skates | 399 | 3 | 121 | 1 | 16 | (6) | 3 | (6) | 448 | 9 |
| Skipper or "billfish" | 1 | (6) | | | | | | | | |
| Smelt | 639 | 71 | 1 | (6) | | | | | 2,085 | 122 |
| Snapper: | | | | | | | | | | |
| Mangrove | | | | | | | 195 | 7 | | |
| Red | | | 54 | 4 | (6) | (6) | 7,522 | 516 | | |
| Snook or sergeantfish | | | | | | | 533 | 21 | | |
| Spadefish | | | | | | | 51 | 1 | | |
| Spanish mackerel | | | 51 | 4 | 839 | 21 | 6,433 | 292 | 27 | 1 |
| Splittail | | | | | | | | | 11 | (6) |
| Spot | 2 | (6) | 18 | (6) | 3,006 | 56 | 5,866 | 105 | | |
| Squawfish | | | | | | | | | 1 | (6) |
| Squeteagues or "sea trout": | | | | | | | | | | |
| Gray | 201 | 12 | 12,264 | 358 | 13,697 | 268 | 7,531 | 214 | | |
| Spotted | | | | | 148 | 7 | 7,616 | 578 | | |
| White | | | | | | | 493 | 20 | | |
| Squirrel hake | 4 | (6) | 120 | 1 | | | | | | |
| Steelhead trout | | | | | | | | | 2,065 | 122 |
| Striped bass | 450 | 36 | 405 | 47 | 3,016 | 220 | 713 | 70 | 34 | 1 |
| Sturgeon | 10 | 1 | 8 | 1 | 13 | 2 | 69 | 7 | 154 | 5 |
| Suckers | 139 | 5 | 70 | 4 | 3 | (6) | 3 | (6) | 8 | (6) |
| Sunfish | | | 2 | (6) | 1 | (6) | 981 | 29 | | |
| Surffishes (perch) | | | | | | | | | 336 | 14 |
| Swellfish | | | 56 | 1 | 9 | (6) | | | | |
| Swordfish | 1,868 | 291 | 109 | 20 | | | | | 625 | 85 |
| Tautog | 204 | 9 | 21 | (6) | 1 | (6) | | | | |
| Tenpounder | | | | | | | 455 | 8 | | |
| Thimble-eyed mackerel | 5 | (6) | 63 | 2 | | | | | | |
| Tilefish | 36 | 1 | 2,390 | 102 | | | | | | |
| Tomcod | 8 | (6) | 3 | (6) | (6) | (6) | | | 1 | (6) |
| Tripletail | | | | | | | 25 | (6) | | |
| Tuna and tunalike fishes: | | | | | | | | | | |
| Albacore | | | | | | | | | 3,520 | 287 |
| Bluefin | 929 | 32 | 94 | 4 | (6) | (6) | | | 12,694 | 725 |
| Bonito | | | | | | | | | 7,808 | 286 |
| Skipjack | | | | | | | | | 47,104 | 2,319 |
| Yellowfin | | | | | | | | | 91,522 | 5,458 |
| Turbot | (6) | (6) | | | | | | | | |
| Whitebait | | | | | | | | | 86 | 5 |
| Whitefish, common | | | | | | | | | 57 | 3 |
| White perch | 3 | (6) | 102 | 10 | 492 | 18 | 162 | 7 | | |
| Whiting | 22,480 | 258 | 13,813 | 179 | 17 | (6) | | | | |
| Wolffish | 2,558 | 49 | 6 | (6) | | | | | | |

[6] Less than 500 pounds or dollars.

## *Fisheries of the United States and Alaska, 1937*—Continued

### CATCH: BY SECTIONS—Continued

[Expressed in thousands of pounds and thousands of dollars; that is 000 omitted]

| Species | New England |  | Middle Atlantic |  | Chesapeake |  | South Atlantic and Gulf |  | Pacific |  |
|---|---|---|---|---|---|---|---|---|---|---|
| FISH—continued | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Yellow perch | (6) | (6) | 41 | 3 | 264 | 15 | 7 | (6) |  |  |
| Yellowtail |  |  | 1 | (6) |  |  | 109 | 8 | 5, 371 | 212 |
| Miscellaneous |  |  |  |  |  |  |  |  | 167 | 3 |
| Total | 615, 167 | 13,524 | 230, 194 | 3, 700 | 209, 484 | 2, 376 | 343, 669 | 5, 648 | 1, 553, 757 | 26, 723 |
| SHELLFISH, ETC. |  |  |  |  |  |  |  |  |  |  |
| Crabs: |  |  |  |  |  |  |  |  |  |  |
| Hard | 2, 514 | 68 | 1, 411 | 38 | 44, 126 | 958 | 29, 086 | 434 | 8, 356 | 721 |
| King or "horseshoe" |  |  | 3, 256 | 8 |  |  |  |  |  |  |
| Rock | 2 | (6) |  |  |  |  |  |  |  |  |
| Soft and peelers | 1 | (6) | 150 | 38 | 4, 989 | 436 | 483 | 75 |  |  |
| Stone |  |  |  |  |  |  | 46 | 9 |  |  |
| Crawfish |  |  |  |  |  |  |  |  | 85 | 9 |
| Lobsters: |  |  |  |  |  |  |  |  |  |  |
| Common | 10, 936 | 2, 304 | 640 | 133 |  |  |  |  |  |  |
| Spiny |  |  |  |  |  |  | 293 | 22 | 1, 322 | 163 |
| Shrimp | 7 | 1 | 116 | 16 | 2 | (6) | 141, 273 | 5, 009 | 1, 158 | 24 |
| Abalone |  |  |  |  |  |  |  |  | 573 | 93 |
| Clams: |  |  |  |  |  |  |  |  |  |  |
| Coquina |  |  |  |  |  |  | 4 | (6) |  |  |
| Hard | 3, 809 | 442 | 5, 078 | 877 | 1, 695 | 282 | 1, 186 | 84 | 979 | 70 |
| Pismo |  |  |  |  |  |  |  |  | 56 | 11 |
| Razor | 726 | 19 |  |  |  |  |  |  | 480 | 94 |
| Soft | 14, 677 | 934 | 1, 960 | 156 |  |  |  |  | 30 | 8 |
| Surf | 9 | 1 | 1, 586 | 79 |  |  |  |  |  |  |
| Mixed |  |  |  |  |  |  |  |  | 78 | 7 |
| Conchs | 19 | 1 | 13 | 1 |  |  | 7 | 1 |  |  |
| Mussels, sea | 16 | 1 | 93 | 5 | 28 | 1 |  |  | (6) | (6) |
| Octopus |  |  |  |  |  |  |  |  | 88 | 4 |
| Oysters, market: |  |  |  |  |  |  |  |  |  |  |
| Eastern, public | 187 | 29 | 896 | 141 | 22, 549 | 1, 543 | 19, 472 | 978 |  |  |
| Eastern, private | 11, 229 | 1, 521 | 13, 721 | 2, 229 | 9, 167 | 758 | 10, 166 | 717 | 68 | 23 |
| Japanese |  |  |  |  |  |  |  |  | 7, 891 | 562 |
| Western |  |  |  |  |  |  |  |  | 281 | 202 |
| Periwinkles and "cockles" | 72 | 2 |  |  |  |  |  |  |  |  |
| Scallops: |  |  |  |  |  |  |  |  |  |  |
| Bay | 1, 552 | 304 | 36 | 9 |  |  | 181 | 21 | 24 | 5 |
| Sea | 5. 659 | 629 | 3, 053 | 343 | 11 | 2 |  |  |  |  |
| Squid | 3, 295 | 42 | 2, 353 | 67 | 185 | 3 |  |  | 503 | 16 |
| Sea urchins | 82 | (6) |  |  |  |  |  |  |  |  |
| Terrapin |  |  | 1 | (6) | 3 | 2 | 29 | 3 |  |  |
| Turtles |  |  | 22 | 1 | 6 | (6) | 225 | 5 |  |  |
| Irish moss | 182 | 16 |  |  |  |  |  |  |  |  |
| Kelp | 120 | 1 |  |  |  |  |  |  |  |  |
| Sponges |  |  |  |  |  |  | 631 | 1, 220 |  |  |
| Bloodworms | 264 | 42 | 35 | 27 |  |  |  |  |  |  |
| Sandworms | 327 | 55 | 38 | 28 |  |  |  |  |  |  |
| Starfish | 12 | 1 |  |  |  |  |  |  |  |  |
| Trepang |  |  |  |  |  |  |  |  | 10 | 1 |
| Total | 55, 697 | 6, 413 | 34, 458 | 4, 196 | 82, 761 | 3, 985 | 203, 082 | 8, 578 | 21, 982 | 2, 013 |
| WHALE PRODUCTS[7] |  |  |  |  |  |  |  |  |  |  |
| Meat |  |  |  |  |  |  |  |  | 625 | 12 |
| Oil, whale |  |  |  |  |  |  |  |  | 513 | 29 |
| Total |  |  |  |  |  |  |  |  | 1, 138 | 41 |
| Grand total | 670, 864 | 19, 937 | 264, 652 | 7, 896 | 292, 245 | 6, 361 | 546, 751 | 14, 226 | 1, 576, 877 | 28, 777 |

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[6] Less than 500 pounds or dollars.

[7] The weight of whales caught was not determined; therefore, the weight of manufactured products is shown. This tabulation does not include data on the whale fishery, conducted by United States enterprise in the Southern Hemisphere. For data on this fishery, the reader is referred to the following sections of this report: "Manufactured Fishery Products," "Canned Fishery Products and Byproducts Trade," the manufactured products table in the section entitled "Middle Atlantic States," and to the section entitled "Whaling."

*Fisheries of the United States and Alaska, 1937*—Continued

CATCH: BY SECTIONS—Continued

[Expressed in thousands of pounds and thousands dollars; that is 000 omitted]

| Species | Lakes | | Mississippi River and tributaries | | Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| FISH | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Alewives | | | | | | | 30, 023 | 280 |
| Amberjack | | | | | | | 51 | 1 |
| Anchovies | | | | | | | 258 | 4 |
| Angelfish | | | | | | | 9 | (6) |
| Barracuda | | | | | | | 2, 933 | 161 |
| Black bass | | | 14 | 2 | | | 55 | 7 |
| Bluefish | | | | | | | 8, 472 | 477 |
| Blue pike | 11, 021 | 646 | | | | | 11, 021 | 646 |
| Blue runner or hardtail | | | | | | | 784 | 9 |
| Bonito | | | | | | | 308 | 15 |
| Bowfin | 1 | (6) | 428 | 9 | | | 432 | 9 |
| Buffalofish | | | 15, 772 | 687 | | | 16, 488 | 724 |
| Burbot | 494 | 7 | | | | | 494 | 7 |
| Butterfish | | | | | | | 9, 887 | 372 |
| Cabio or crab eater | | | | | | | 22 | 1 |
| Cabrilla | | | | | | | 131 | 7 |
| Carp | 5, 160 | 136 | 11, 892 | 456 | | | 18, 721 | 665 |
| Catfish and bullheads | 1, 120 | 70 | 10, 267 | 878 | | | 19, 979 | 1, 358 |
| Cero | | | | | | | 51 | 1 |
| Chub | 6, 044 | 903 | | | | | 6, 044 | 903 |
| Cigarfish | | | | | | | 17 | (6) |
| Cisco | 64 | 7 | | | | | 64 | 7 |
| Cod | | | | | 624 | 4 | 154, 282 | 3, 079 |
| Crappie | (6) | (6) | 41 | 3 | | | 568 | 21 |
| Crevalle | | | | | | | 198 | 4 |
| Croaker | | | | | | | 49, 483 | 742 |
| Cunner | | | | | | | 43 | 1 |
| Cusk | | | | | | | 10, 263 | 187 |
| Dolly Varden trout | | | | | 55 | 3 | 55 | 3 |
| Dolphin | | | | | | | 3 | (6) |
| Drum: | | | | | | | | |
| Black | | | | | | | 1, 946 | 50 |
| Red or redfish | | | | | | | 3, 280 | 165 |
| Eels: | | | | | | | | |
| Common | 10 | (6) | 7 | 1 | | | 1, 320 | 108 |
| Conger | | | | | | | 96 | 2 |
| Flounders | | | | | 200 | 4 | 77, 090 | 3, 279 |
| Flyingfish | | | | | | | 42 | 2 |
| Frigate mackerel | | | | | | | 185 | 2 |
| Garfish | 6 | (6) | 73 | 1 | | | 85 | 1 |
| Gizzard shad | | | | | | | 390 | 5 |
| Goldfish | 267 | 5 | | | | | 267 | 5 |
| Goosefish | | | | | | | 37 | (6) |
| Grayfish | | | | | | | 2, 628 | 31 |
| Groupers | | | | | | | 5, 626 | 179 |
| Grunts | | | | | | | 59 | 1 |
| Haddock | | | | | | | 171, 769 | 4, 248 |
| Hake | | | | | | | 25, 542 | 370 |
| Halibut | | | | | 18, 974 | 1, 005 | 45, 834 | 34, 438 |
| Hardheads | | | | | | | 54 | 5 |
| Harvestfish or "starfish" | | | | | | | 1, 734 | 30 |
| Herring: | | | | | | | | |
| Lake | 21, 557 | 621 | | | | | 21, 557 | 621 |
| Sea | | | | | 206, 446 | 1, 032 | 261, 651 | 1, 350 |
| Herring smelt | | | | | | | 10 | (6) |
| Hickory shad | | | | | | | 358 | 9 |
| Hogchoker | | | | | | | 18 | (6) |
| Hogfish | | | | | | | 22 | (6) |
| Horse mackerel | | | | | | | 6, 542 | 65 |
| Jewfish | | | | | | | 85 | 3 |
| Kingfish (California) | | | | | | | 646 | 16 |
| Kingfish or "king mackerel" | | | | | | | 3, 508 | 130 |
| King whiting or "kingfish" | | | | | | | 2, 034 | 49 |
| Lake trout | 9, 428 | 1, 521 | | | | | 9, 428 | 1, 521 |
| Lamprey | | | | | | | 3 | (6) |
| Launce | | | | | | | 268 | 3 |
| "Lingcod" | | | | | 3 | 1 | 2, 734 | 102 |
| Mackerel | | | | | | | 87, 537 | 1, 725 |
| Marlin | | | | | | | 4 | (6) |
| Menhaden | | | | | | | 482, 137 | 1, 760 |
| Minnows | | | 1 | (6) | | | 3 | 1 |
| Mojarra | | | | | | | 349 | 7 |
| Mooneye | 15 | (6) | 3 | (6) | | | 18 | (6) |
| Moonfish | | | | | | | 5 | (6) |

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[6] Less than 500 pounds or dollars

## *Fisheries of the United States and Alaska, 1937*—Continued

CATCH: BY SECTIONS—Continued

[Expressed in thousands of pounds and thousands of dollars; that is 000 omitted]

| Species | Lakes | | Mississippi River and tributaries | | Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| FISH—continued | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Mullet | | | | | | | 36, 298 | 1, 201 |
| Mummichog | | | | | | | 2 | (6) |
| Muttonfish | | | | | | | 233 | 14 |
| Paddlefish or spoonbill cat | | | 951 | 43 | | | 1, 022 | 47 |
| Permit | | | | | | | 12 | (6) |
| Pigfish | | | | | | | 117 | 2 |
| Pike or pickerel | 259 | 12 | 5 | 1 | | | 304 | 19 |
| Pilchard | | | | | | | 1, 139, 505 | 6, 815 |
| Pinfish | | | | | | | 70 | 1 |
| Pollock | | | | | | | 37, 684 | 527 |
| Pompano | | | | | | | 716 | 142 |
| Quillback | | | 268 | 11 | | | 268 | 11 |
| Rock bass | 37 | 1 | | | | | 361 | 19 |
| Rockfishes | | | | | 26 | (6) | 4, 915 | 214 |
| Rosefish | | | | | | | 58, 357 | 887 |
| Rudderfish | | | | | | | 38 | 2 |
| Sablefish | | | | | 2, 990 | 91 | 6, 939 | 283 |
| Salmon: | | | | | | | | |
| Atlantic | | | | | | | 29 | 6 |
| Blueback, red, or sockeye | | | | | 193, 459 | 5, 458 | 200, 501 | 6, 195 |
| Chinook or king | | | | | 21, 435 | 549 | 57, 027 | 3, 416 |
| Chum or keta | | | | | 80, 465 | 895 | 91, 900 | 1, 189 |
| Humpback or pink | | | | | 282, 284 | 4, 616 | 307, 709 | 5, 253 |
| Silver or coho | | | | | 15, 741 | 359 | 31, 908 | 1, 250 |
| Sauger | 1, 636 | 88 | 2 | (6) | | | 1, 638 | 88 |
| Sculpin | | | | | | | 146 | 11 |
| Scup or porgy | | | | | | | 18, 822 | 382 |
| Sea bass | | | | | | | 6, 513 | 366 |
| Sea bass, white (California) | | | | | | | 602 | 57 |
| Sea catfish | | | | | | | 272 | 7 |
| Sea robin | | | | | | | 255 | 3 |
| Shad | | | | | | | 10, 861 | 984 |
| Sharks | | | | | | | 2, 756 | 19 |
| Sheepshead: | | | | | | | | |
| Fresh-water | 4, 069 | 65 | 3, 905 | 143 | | | 8, 578 | 225 |
| Salt-water | | | | | | | 1. 230 | 40 |
| Silversides | | | | | | | (6) | (6) |
| Skates | | | | | | | 987 | 13 |
| Skipper or "billfish" | | | | | | | 1 | (6) |
| Smelt | 1, 426 | 67 | | | (6) | (6) | 4, 151 | 260 |
| Snapper: | | | | | | | | |
| Mangrove | | | | | | | 195 | 7 |
| Red | | | | | | | 7, 576 | 520 |
| Snook or sergeantfish | | | | | | | 533 | 21 |
| Spadefish | | | | | | | 51 | 1 |
| Spanish mackerel | | | | | | | 7, 350 | 318 |
| Splittail | | | | | | | 11 | (6) |
| Spot | | | | | | | 8, 892 | 161 |
| Squawfish | | | | | | | 1 | (6) |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | | | | | 33, 693 | 852 |
| Spotted | | | | | | | 7, 764 | 585 |
| White | | | | | | | 493 | 20 |
| Squirrel hake | | | | | | | 124 | 1 |
| Steelhead trout | | | | | 22 | 2 | 2, 087 | 124 |
| Striped bass | | | | | | | 4, 618 | 374 |
| Sturgeon | 18 | 6 | | | | | 272 | 22 |
| Sturgeon, shovelnose | | | 87 | 8 | | | 87 | 8 |
| Suckers | 5, 892 | 161 | 315 | 13 | | | 6, 430 | 183 |
| Sunfish | 32 | 1 | 22 | 1 | | | 1, 038 | 31 |
| Surffishes (perch) | | | | | | | 336 | 14 |
| Swellfish | | | | | | | 65 | 1 |
| Swordfish | | | | | | | 2, 602 | 396 |
| Tautog | | | | | | | 226 | 9 |
| Tenpounder | | | | | | | 455 | 8 |
| Thimble-eyed mackerel | | | | | | | 68 | 2 |
| Tilefish | | | | | | | 2, 426 | 103 |
| Tomcod | | | | | | | 12 | (6) |
| Tripletail | | | | | | | 25 | (6) |
| Tullibees | 223 | 5 | | | | | 223 | 5 |
| Tuna and tunalike fishes: | | | | | | | | |
| Albacore | | | | | | | 3. 520 | 287 |
| Bluefin | | | | | | | 13, 717 | 761 |
| Bonito | | | | | | | 7, 808 | 286 |

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[6] Less than 500 pounds or dollars.

## *Fisheries of the United States and Alaska, 1937*—Continued

CATCH: BY SECTIONS—Continued

[Expressed in thousands of pounds and thousands of dollars: that is 000 omitted]

| Species | Lakes | | Mississippi River and tributaries | | Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| FISH—continued | | | | | | | | |
| Tuna and tunalike fishes—Con. | | | | | | | | |
| Skipjack | | | | | | | 47, 104 | 2, 319 |
| Yellowfin | | | | | | | 91, 522 | 5, 458 |
| Turbot | | | | | | | (6) | (6) |
| White bass | 435 | 20 | 4 | (6) | | | 439 | 20 |
| Whitebait | | | | | | | 86 | 5 |
| Whitefish: | | | | | | | | |
| Common | 3, 228 | 668 | | | | | 3, 285 | 671 |
| Menominee | 138 | 13 | | | | | 138 | 13 |
| White perch | | | | | | | 759 | 35 |
| Whiting | | | | | | | 36, 310 | 437 |
| Wolffish | | | | | | | 2, 564 | 49 |
| Yellow perch | 5, 067 | 433 | | | | | 5, 379 | 451 |
| Yellow pike | 5, 458 | 550 | 5 | 1 | | | 5, 463 | 551 |
| Yellowtail | | | | | | | 5, 481 | 220 |
| Miscellaneous | | | | | | | 167 | 3 |
| Total | 83, 105 | 6, 006 | 44, 662 | 2, 258 | 822, 724 | 14,109 | 3, 902. 162 | 74, 254 |
| SHELLFISH, ETC | | | | | | | | |
| Crabs: | | | | | | | | |
| Hard | | | | | 1, 393 | 138 | 86, 886 | 2, 357 |
| King (Pacific coast) | | | | | 6 | (6) | 6 | (6) |
| King or "horseshoe" | | | | | | | 3, 256 | 8 |
| Rock | | | | | | | 2 | (6) |
| Soft and peelers | | | | | | | 5, 623 | 549 |
| Stone | | | | | | | 46 | 9 |
| Crawfish | 6 | 1 | 29 | (6) | | | 120 | 10 |
| Lobsters: | | | | | | | | |
| Common | | | | | | | 11, 576 | 2, 437 |
| Spiny | | | | | | | 1, 615 | 185 |
| Shrimp | | | 49 | 4 | 843 | 33 | 143, 448 | 5, 087 |
| Abalone | | | | | | | 573 | 93 |
| Clams: | | | | | | | | |
| Coquina | | | | | | | 4 | (6) |
| Hard | | | | | 13 | 1 | 12, 760 | 1, 756 |
| Pismo | | | | | | | 56 | 11 |
| Razor | | | | | 804 | 47 | 2, 010 | 160 |
| Soft | | | | | | | 16, 667 | 1, 098 |
| Surf | | | | | | | 1, 595 | 80 |
| Mixed | | | | | | | 78 | 7 |
| Conchs | | | | | | | 39 | 3 |
| Mussels, sea | | | | | | | 137 | 7 |
| Mussel shells | 847 | 26 | 37, 254 | 421 | | | 38, 101 | 447 |
| Octopus | | | | | | | 88 | 4 |
| Oysters, market: | | | | | | | | |
| Eastern, public | | | | | | | 43, 104 | 2, 691 |
| Eastern, private | | | | | | | 44, 351 | 5, 248 |
| Japanese | | | | | | | 7, 891 | 562 |
| Western | | | | | | | 281 | 202 |
| Periwinkles and "cockles" | | | | | | | 72 | 2 |
| Scallops: | | | | | | | | |
| Bay | | | | | | | 1, 793 | 339 |
| Sea | | | | | | | 8, 723 | 974 |
| Squid | | | | | | | 6, 336 | 128 |
| Sea urchins | | | | | | | 82 | (6) |
| Terrapin | | | 19 | (6) | | | 52 | 5 |
| Turtles | | | 95 | 4 | | | 348 | 10 |
| Frogs | | | 875 | 131 | | | 875 | 131 |
| Irish moss | | | | | | | 182 | 16 |
| Kelp | | | | | | | 120 | 1 |
| Sponges | | | | | | | 631 | 1, 220 |
| Pearls and slugs | | (6) | | 80 | | | | 80 |
| Bloodworms | | | | | | | 299 | 69 |
| Sandworms | | | | | | | 365 | 83 |
| Starfish | | | | | | | 12 | 1 |
| Trepang | | | | | | | 10 | 1 |
| Total | 853 | 27 | 38, 321 | 640 | 3, 059 | 219 | 440, 213 | 26, 071 |

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[6] Less than 500 pounds or dollars.

## *Fisheries of the United States and Alaska, 1937*—Continued

### CATCH: By sections—Continued

[Expressed in thousands of pounds and thousands of dollars; that is 000 omitted]

| Species | Lakes | | Mississippi River and tributaries | | Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| WHALE PRODUCTS [7] | | | | | | | | |
| Meat | | | | | | | 625 | 12 |
| Fertilizer | | | | | 2,410 | 33 | 2,410 | 33 |
| Oil, sperm | | | | | 1,262 | 46 | 1,262 | 46 |
| Oil, whale | | | | | 5,364 | 400 | 5,877 | 429 |
| Total | | | | | 9,036 | 479 | 10,174 | 520 |
| Grand total | 83,958 | 6,033 | 82,383 | 2,898 | 834,819 | 14,717 | 1,352,549 | 100,845 |

### CATCH: By States

[Expressed in thousands of pounds and thousands of dollars; that is 000 omitted]

| States | Marine and coastal rivers | | Mississippi River and tributaries | | Lakes [8] | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Alabama | 10,917 | 461 | 1,822 | 33 | | | 12,739 | 494 |
| Arkansas | | | 15,733 | 412 | | | 15.733 | 412 |
| California | 1,352,128 | 18,945 | | | | | 1,352,128 | 18,945 |
| Connecticut | 16,063 | 1,440 | | | | | 16.063 | 1,440 |
| Delaware | 50,940 | 319 | | | | | 50,940 | 319 |
| Florida | 230,149 | 4,983 | | | 2,026 | 68 | 232,175 | 5,051 |
| Georgia | 22,443 | 406 | | | | | 22,443 | 406 |
| Illinois | | | 14,263 | 367 | 1,461 | 193 | 15,724 | 560 |
| Indiana | | | 7,717 | 157 | 781 | 84 | 8,498 | 241 |
| Iowa | | | 7,778 | 302 | | | 7,778 | 302 |
| Kansas | | | 455 | 17 | | | 455 | 17 |
| Kentucky | | | 1,622 | 61 | | | 1,622 | 61 |
| Louisiana | 97,010 | 3,601 | 19,214 | 995 | | | 116,224 | 4 596 |
| Maine | 101,179 | 2,806 | | | | | 101,179 | 2,806 |
| Maryland | 49 953 | 2,532 | | | | | 49,953 | 2,532 |
| Massachusetts | 534,110 | 14,198 | | | | | 534,110 | 14,198 |
| Michigan | | | | | 28,984 | 2,435 | 28.984 | 2,435 |
| Minnesota | | | 3,498 | 138 | 8,150 | 293 | 11,648 | 431 |
| Mississippi | 39,080 | 1,731 | 2,650 | 123 | | | 41,730 | 1,854 |
| Missouri | | | 928 | 77 | | | 928 | 77 |
| Nebraska | | | 145 | 16 | | | 145 | 16 |
| New Hampshire | 664 | 96 | | | | | 664 | 96 |
| New Jersey | 129,516 | 3,201 | | | | | 129,516 | 3,201 |
| New York | 84,161 | 4,371 | | | 2,451 | 187 | 86,612 | 4,558 |
| North Carolina | 112,755 | 1,658 | | | | | 112.755 | 1,658 |
| Ohio | | | 185 | 7 | 21,088 | 1,013 | 21,273 | 1,020 |
| Oklahoma | | | 40 | 4 | | | 40 | 4 |
| Oregon | 68,945 | 2,609 | | | | | 68.945 | 2,609 |
| Pennsylvania | 35 | 5 | | | 3,007 | 238 | 3.042 | 243 |
| Rhode Island | 18,847 | 1,398 | | | | | 18.847 | 1,398 |
| South Carolina | 7,166 | 268 | | | | | 7,166 | 268 |
| South Dakota | | | 114 | 11 | | | 114 | 11 |
| Tennessee | | | 3,435 | 104 | | | 3,435 | 104 |
| Texas | 25,205 | 1,050 | 139 | 6 | | | 25,344 | 1,056 |
| Virginia | 242 292 | 3,829 | | | | | 242,292 | 3,829 |
| Washington | 155,805 | 7,222 | | | | | 155,805 | 7,222 |
| Wisconsin | | | 2 645 | 68 | 18,036 | 1,590 | 20,681 | 1,658 |
| Alaska | 834,819 | 14,717 | | | | | 834,819 | 14,717 |
| Total | 4,184,182 | 91,846 | 82,383 | 2,898 | 85,984 | 6,101 | 4,352,549 | 100,845 |

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[7] The weight of whales caught was not determined; therefore, the weight of manufactured products is shown. This tabulation does not include data on the whale fishery, conducted by United States enterprise in the Southern Hemisphere. For data on this fishery, the reader is referred to the following sections of this report: "Manufactured Fishery Products," "Canned Fishery Products and Byproducts Trade," the manufactured products table in the section entitled "Middle Atlantic States," and to the section entitled "Whaling."

[8] Includes Lake Ontario, Lake Erie, Lake Huron, Lake Michigan, Lake Superior, Rainy Lake, Namakan Lake, Lake of the Woods, Lake Okeechobee, and several mussel-bearing streams tributary to Lakes Huron, Erie, and Michigan.

*Fisheries of the United States and Alaska, 1937*—Continued

SEED OYSTER FISHERY

| Item | New England | | Middle Atlantic | |
|---|---|---|---|---|
| OPERATING UNITS | | | | |
| Fishermen: | *Number* | | *Number* | |
| On vessels | 189 | | 1,226 | |
| On boats and shore: | | | | |
| Regular | 162 | | 192 | |
| Casual | 71 | | 159 | |
| Total | 422 | | 1,577 | |
| Vessels: | | | | |
| Steam | 3 | | | |
| Net tonnage | 279 | | | |
| Motor | 20 | | 7 | |
| Net tonnage | 461 | | 172 | |
| Sail | 23 | | 108 | |
| Net tonnage | 169 | | 2,460 | |
| Total vessels | 46 | | 115 | |
| Total net tonnage | 909 | | 2,632 | |
| Boats: | | | | |
| Motor | 3 | | 95 | |
| Other | 1 | | 249 | |
| Apparatus: | | | | |
| Dredges | 193 | | 230 | |
| Yards at mouth | 172 | | 291 | |
| Tongs | 97 | | 346 | |
| Rakes | 11 | | 5 | |
| CATCH | | | | |
| Oysters, seed: | *Bushels* | *Value* | *Bushels* | *Value* |
| Public, spring | 62,945 | $47,685 | 1,184,439 | $452,665 |
| Public, fall | 43,087 | 29,856 | 24,323 | 16,740 |
| Private, spring | 284,800 | 278,700 | 5,766 | 4,996 |
| Private, fall | 63,727 | 60,492 | 32,161 | 33,290 |
| Total | 454,559 | 416,733 | 1,246,689 | 507,691 |

| Item | Chesapeake | | South Atlantic and Gulf | | Total | |
|---|---|---|---|---|---|---|
| OPERATING UNITS | | | | | | |
| Fishermen: | *Number* | | *Number* | | *Number* | |
| On vessels | 37 | | | | 1,452 | |
| On boats and shore: | | | | | | |
| Regular | 1,051 | | 17 | | 1,422 | |
| Casual | 132 | | | | 362 | |
| Total | 1,220 | | 17 | | 3,236 | |
| Vessels: | | | | | | |
| Steam | | | | | 3 | |
| Net tonnage | | | | | 279 | |
| Motor | 13 | | | | 40 | |
| Net tonnage | 69 | | | | 702 | |
| Sail | | | | | 131 | |
| Net tonnage | | | | | 2,629 | |
| Total vessels | 13 | | | | 174 | |
| Total net tonnage | 69 | | | | 3,610 | |
| Boats: | | | | | | |
| Motor | 433 | | | | 531 | |
| Other | 33 | | 8 | | 401 | |
| Apparatus: | | | | | | |
| Dredges | | | 14 | | 437 | |
| Yards at mouth | | | 14 | | 477 | |
| Tongs | 910 | | | | 1,353 | |
| Rakes | | | | | 16 | |
| CATCH | | | | | | |
| Oysters, seed: | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* |
| Public, spring | 249,900 | $62,479 | 8,000 | $1,760 | 1,505,284 | $564,589 |
| Public, fall | 544,200 | 136,006 | | | 611,610 | 182,602 |
| Private, spring | | | | | 290,566 | 283,696 |
| Private, fall | 2,400 | 600 | | | 98,288 | 94,382 |
| Total | 796,500 | 199,085 | 8,000 | 1,760 | 2,505,748 | 1,125,269 |

NOTE.—Of the total number of persons fishing for seed oysters 2,574 are duplicated among those fishing for market oysters or other species. Similarly the following craft and gear are duplicated: 68 vessels, 390 motor boats, 332 other boats, 152 dredges, 951 tongs, and 4 rakes.

*Yield of the fisheries of the United States, 1937:*[1] *By gear*

| Gear | New England | | Middle Atlantic | | Chesapeake | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Purse seines | 14,775,000 | $584,818 | 147,436,300 | $722,603 | 119,763,000 | $478,923 |
| Haul seines | 1,127,000 | 41,516 | 1,887,300 | 117,419 | 9,759,100 | 230,994 |
| Gill nets | 23,197,900 | 490,123 | 4,800,800 | 351,330 | 1,653,000 | 125,247 |
| Lines | 72,862,900 | 1,783,735 | 10,638,200 | 436,016 | 38,996,500 | 809,985 |
| Pound nets | 21,196,800 | 408,294 | 42,114,900 | 991,296 | 70,577,000 | 1,316,354 |
| Floating traps | 13,271,800 | 266,195 | ------ | ------ | ------ | ------ |
| Other traps | 40,500 | 3,708 | 13,400 | 730 | 11,200 | 275 |
| Weirs | 21,528,100 | 111,148 | 998,200 | 2,170 | ------ | ------ |
| Stop nets | 28,266,500 | 161,577 | 196,300 | 14,331 | 26,700 | 560 |
| Fyke nets | 135,200 | 6,022 | 467,500 | 30,035 | 1,525,500 | 80,145 |
| Dip nets | 4,359,300 | 70,571 | [2] 332,600 | [2] 36,281 | 2,209,600 | 194,692 |
| Cast nets | ------ | ------ | 3,800 | 289 | ------ | ------ |
| Scap nets | 7,900 | 395 | ------ | ------ | ------ | ------ |
| Bag nets | 157,700 | 16,700 | ------ | ------ | ------ | ------ |
| Drag nets | ------ | ------ | 13,800 | 3,450 | ------ | ------ |
| Push nets | 63,000 | 21,000 | 20,300 | 5,075 | ------ | ------ |
| Otter trawls | 415,434,200 | 9,348,456 | 26,563,300 | 1,018,889 | 6,234,900 | 146,539 |
| Pots | 13,718,800 | 2,390,429 | 2,472,000 | 234,353 | 836,700 | 36,588 |
| Harpoons | 2,070,400 | 296,856 | 107,200 | 19,857 | ------ | ------ |
| Spears | 26,500 | 2,435 | 50,800 | 3,955 | ------ | ------ |
| Scrapes, crab | ------ | ------ | ------ | ------ | 2,016,900 | 156,312 |
| Dredges | 18,584,100 | 2,374,098 | 18,793,300 | 2,656,969 | 11,631,300 | 713,515 |
| Tongs | 2,269,700 | 329,597 | 4,257,700 | 720,575 | 24,245,600 | 1,817,852 |
| Rakes | 1,324,600 | 154,607 | 2,305,000 | 335,342 | 1,835,200 | 127,300 |
| Forks | 601,500 | 71,734 | 73,200 | 54,812 | ------ | ------ |
| Hoes | 15,425,600 | 981,650 | 1,177,700 | 68,646 | ------ | ------ |
| Picks | 84,800 | 640 | ------ | ------ | 277,000 | 49,200 |
| By hand | 334,500 | 20,984 | 928,300 | 71,567 | 645,200 | 76,753 |
| Total | 670,864,300 | 19,937,288 | 264,651,900 | 7,895,990 | 292,244,400 | 6,361,234 |

| Gear | South Atlantic and Gulf | | Pacific | | Lakes | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Purse seines | 210,932,000 | $618,515 | 996,664,800 | $8,729,325 | ------ | ------ |
| Haul seines | 38,761,800 | 1,227,825 | 5,328,700 | 323,462 | 5,820,600 | $171,690 |
| Gill nets | 45,732,100 | 1,787,321 | 35,677,500 | 2,070,844 | 40,779,300 | 3,391,081 |
| Trammel nets | 8,991,500 | 449,945 | 1,099,700 | 82,272 | 113,900 | 1,953 |
| Lines | 50,952,900 | 1,605,667 | 213,774,000 | 12,103,395 | 2,239,500 | 361,178 |
| Pound nets | 12,650,100 | 268,025 | 1,499,900 | 80,915 | 7,571,300 | 476,305 |
| Other traps | 143,000 | 21,650 | 9,903,500 | 897,116 | 23,334,800 | 1,397,352 |
| Weirs | ------ | ------ | 407,000 | 4,343 | ------ | ------ |
| Wheels | 32,300 | 377 | ------ | ------ | ------ | ------ |
| Fyke nets | 985,500 | 34,381 | 345,300 | 36,652 | 3,246,100 | 206,926 |
| Dip nets | 2,164,300 | 94,091 | 2,089,200 | 162,072 | ------ | ------ |
| Cast nets | 461,700 | 15,043 | ------ | ------ | ------ | ------ |
| Bag nets | ------ | ------ | 694,900 | 10,052 | ------ | ------ |
| Push nets | [3] 3,700 | [3] 450 | ------ | ------ | ------ | ------ |
| Reef nets | ------ | ------ | 1,409,500 | 70,057 | ------ | ------ |
| Lampara and ring nets | ------ | ------ | 276,948,700 | 2,233,772 | ------ | ------ |
| Paranzella nets | ------ | ------ | [4] 12,913,000 | [4] 617,448 | ------ | ------ |
| Otter trawls | 139,596,800 | 4,958,463 | 5,411,400 | 140,224 | ------ | ------ |
| Beam trawls | ------ | ------ | 509,900 | 19,505 | ------ | ------ |
| Pots | 3,365,000 | 99,219 | ------ | ------ | 6,400 | 642 |
| Harpoons | ------ | ------ | 1,764,200 | 126,242 | ------ | ------ |
| Spears | 303,200 | 21,578 | ------ | ------ | ------ | ------ |
| Dredges | 17,836,000 | 903,163 | (5) | (5) | ------ | ------ |
| Tongs | 9,275,400 | 712,564 | 9,863,600 | 976,035 | ------ | ------ |
| Crowfoot bars | ------ | ------ | ------ | ------ | 635,200 | 18,727 |
| Rakes | 493,900 | 46,148 | (5) | (5) | ------ | ------ |
| Forks | 4,700 | 702 | ------ | ------ | ------ | ------ |
| Grabs | 1,717,400 | 68,070 | ------ | ------ | ------ | ------ |
| Picks | ------ | ------ | ------ | ------ | 109,100 | 3,862 |
| Hooks | 167,100 | 265,584 | ------ | ------ | ------ | ------ |
| Diving apparatus, abalone and sponge | 471,700 | 954,674 | 572,600 | 92,654 | ------ | ------ |
| By hand | 1,708,900 | 72,915 | ------ | ------ | 102,200 | 3,368 |
| Total | 546,751,000 | 14,226,370 | 1,576,877,400 | 28,776,385 | 83,958,400 | 6,033,084 |

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[1] Data are for 1937 except that for Mississippi River and tributaries which are for 1931.

[2] Includes the catch by drop nets and wire baskets.

[3] This catch was made by scoop nets.

[4] Includes a small catch by otter trawls.

[5] The catch by shovels, rakes, and dredges is included with tongs.

*Yield of the fisheries of the United States, 1937: By gear*—Continued

| Gear | Mississippi River and tributaries | | Total | |
|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* |
| Purse seines | | | 1,488,571,100 | $11,134,184 |
| Haul seines | 13,739,657 | $574,541 | 76,424,157 | 2,687,447 |
| Gill nets | 166,598 | 6,547 | 152,007,198 | 8,222,493 |
| Trammel nets | 1,134,206 | 75,615 | 11,339,306 | 609,785 |
| Lines | 10,140,037 | 772,245 | 399,604,037 | 17,872,221 |
| Pound nets | 224,275 | 9,541 | 155,834,275 | 3,550,730 |
| Floating traps | | | 13,271,800 | 266,195 |
| Other traps | | | 33,446,400 | 2,320,831 |
| Weirs | | | 22,933,300 | 117,661 |
| Wheels | | | 32,300 | 377 |
| Stop nets | | | 28,489,500 | 176,468 |
| Fyke nets | 18,507,204 | 797,130 | 25,212,304 | 1,191,291 |
| Dip nets | 30,045 | 3,307 | 11,185,045 | 561,014 |
| Cast nets | | | 465,500 | 15,332 |
| Scap nets | | | 7,900 | 395 |
| Bag nets | | | 852,600 | 26,752 |
| Drag nets | | | 13,800 | 3,450 |
| Push nets | | | 87,000 | 26,525 |
| Reef nets | | | 1,409,500 | 70,057 |
| Lampara and ring nets | | | 276,948,700 | 2,233,772 |
| Paranzella nets | | | 12,913,000 | 617,448 |
| Otter trawls | | | 593,240,600 | 15,612,571 |
| Beam trawls | | | 509,900 | 19,505 |
| Pots | [6] 310,455 | [6] 26,277 | 20,709,355 | 2,787,508 |
| Harpoons | | | 3,941,800 | 442,955 |
| Spears | 2,250 | 270 | 382,750 | 28,238 |
| Scrapes, crab | | | 2,016,900 | 156,312 |
| Dredges | 3,699,100 | 40,958 | 70,543,800 | 6,688,703 |
| Tongs | 1,601,876 | 21,091 | 51,513,876 | 4,577,714 |
| Crowfoot bars | 20,893,550 | 265,443 | 21,528,750 | 284,170 |
| Rakes | 370,130 | 4,029 | 6,328,830 | 667,426 |
| Forks | 4,812,737 | 76,214 | 5,492,137 | 203,462 |
| Hoes | | | 16,603,300 | 1,050,296 |
| Grabs | 873,099 | 130,621 | 2,590,499 | 198,692 |
| Picks | | | 470,900 | 53,701 |
| Hooks | | | 167,100 | 265,584 |
| Diving apparatus, abalone and sponge | | | 1,044,300 | 1,047,328 |
| By hand | 5,877,304 | 93,528 | 9,596,404 | 339,115 |
| Total | 82,382,523 | 2,897,357 | 3,517,729,923 | 86,127,708 |

[6] Includes catch by baskets.

*Industries related to the fisheries of the United States and Alaska, 1937* [1]

| Item | New England | Middle Atlantic | Chesapeake | South Atlantic and Gulf |
|---|---|---|---|---|
| Transporting: | | | | |
| Persons engaged: | *Number* | *Number* | *Number* | *Number* |
| On vessels | 202 | 57 | 1,196 | 344 |
| On boats | 32 | 69 | | 208 |
| Total | 234 | 126 | 1,196 | 552 |
| Vessels: | | | | |
| Steam | | | 1 | |
| Net tonnage | | | 83 | |
| Motor | 87 | 20 | 600 | 137 |
| Net tonnage | 1,294 | 432 | 6,353 | 1,376 |
| Sail | | | 1 | 34 |
| Net tonnage | | | 21 | 326 |
| Total vessels | 87 | 20 | 602 | 171 |
| Total net tonnage | 1,294 | 432 | 6,457 | 1,702 |
| Boats | 18 | 68 | | 147 |
| Wholesale and manufacturing: | | | | |
| Establishments | 400 | 419 | 561 | 725 |
| Persons engaged: | | | | |
| Proprietors | 332 | 211 | 718 | 725 |
| Salaried employees | 802 | 1,020 | 385 | 532 |
| Wage earners: | | | | |
| Average for season | 10,988 | 5,608 | 10,902 | 17,277 |
| Average for year | 6,559 | 4,229 | 4,645 | 5,757 |
| Salaries and wages paid | $7,705,479 | $8,611,693 | $3,068,069 | $3,863,777 |
| Manufactured products | $24,038,947 | $18,658,605 | $10,009,939 | $15,110,653 |
| Fishermen's manufactured products: | | | | |
| Persons engaged | 3,416 | 285 | 80 | 1,476 |
| Products | $1,098,993 | $208,641 | $14,220 | $240,902 |

[1] Data for Mississippi River and tributaries are for 1931 except that the value shown for manufactured products includes that of mussel-shell products for 1937.

*Industries related to the fisheries of the United States and Alaska, 1937*—Continued

| Item | Pacific | Lakes | Mississippi River and tributaries | Alaska | Total |
|---|---|---|---|---|---|
| Transporting: | | | | | |
| Persons engaged: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 210 | 23 | 29 | 2,159 | 4,220 |
| On boats | | 12 | | (2) | 321 |
| Total | 210 | 35 | 29 | 2,159 | 4,541 |
| Vessels: | | | | | |
| Steam | | | | 7 | 8 |
| Net tonnage | | | | 23,986 | 24,069 |
| Motor | 76 | 14 | 8 | 421 | 1,363 |
| Net tonnage | 1,724 | 164 | 104 | 14,505 | 25,952 |
| Sail | | | | | 35 |
| Net tonnage | | | | | 347 |
| Total vessels | 76 | 14 | 8 | 428 | 1,406 |
| Total net tonnage | 1,724 | 164 | 104 | 38,491 | 50,368 |
| Boats | | 4 | | [3] 775 | 1,012 |
| Wholesale and manufacturing: | | | | | |
| Establishments | 330 | 230 | 217 | 236 | 3,118 |
| Persons engaged: | | | | | |
| Proprietors | 377 | 167 | 204 | 16,602 | 93,606 |
| Salaried employees | 1,154 | 445 | 355 | | |
| Wage earners: | | | | | |
| Average for season | 18,261 | 2,266 | 4,275 | | |
| Average for year | 6,989 | 1,277 | 3,483 | (4) | (4) |
| Salaries and wages paid | $10,669,409 | $2,594,914 | $3,080,430 | (4) | (4) |
| Manufactured products | $56,149,695 | $3,196,461 | $4,056,296 | $49,865,339 | $181,085,935 |
| Fishermen's manufactured products: | | | | | |
| Persons engaged | 152 | 223 | 216 | (4) | (4) |
| Products | $212,151 | $51,546 | $8,751 | (4) | (4) |

[2] Included on vessels.
[3] Includes scows, houseboats, pile drivers, etc.
[4] Statistics not available.

NOTE.—Of the total number of persons engaged in the preparation of fishermen's manufactured products 5,574 have also been included as fishermen, and 1,509 of the persons shown on transporting craft have also been included as fishermen.

## MANUFACTURED FISHERY PRODUCTS

The output of manufactured fishery products (canned, cured, packaged, and byproducts) in the United States and Alaska during the most recent years for which data are available was valued at $185,292,159. Of this amount, canned products accounted for 57 percent, byproducts 20 percent, fresh and frozen packaged products 15 percent, and cured products 8 percent.

Since complete general statistical surveys were conducted for 1937 data in each of the geographical sections of the United States and Alaska except the Mississippi River area, the following compilation of manufactured fishery products consists of data for 1937 with the exception of a small quantity of salted and smoked fish produced in the Mississippi River section.

*Manufactured fishery products of the United States and Alaska, 1937* [1]

| Item | Quantity | Value |
|---|---|---|
| Alewives: | | |
| Salted: | | |
| Corned ... pounds | 5,841,359 | $93,178 |
| Pickled ... do | [2] 2,471,575 | 70,701 |
| Spiced ... do | 1,828,353 | 122,160 |
| Round ... do | 1,450,900 | 40,728 |
| Tight-pack cut ... do | 1,667,150 | 56,787 |
| Tight-pack roe alewives ... do | 66,925 | 3,129 |
| Smoked ... do | 242,450 | 12,655 |
| Canned ... standard cases | 54,993 | 139,585 |
| Roe, canned ... do | 51,272 | 304,922 |
| Dry scrap ... tons | 750 | 31,327 |
| Oil ... gallons | 12,450 | 3,073 |
| Amberjack, smoked ... pounds | 900 | 225 |
| Barracuda, fresh fillets ... do | 650,000 | 97,500 |
| Bluefish: | | |
| Salted ... do | 28,600 | 1,688 |
| Smoked ... do | 2,500 | 500 |
| Blue runner, salted ... do | 360,000 | 12,580 |
| Buffalofish, smoked [3] ... do | 925,500 | 239,878 |
| Butterfish, smoked [3] ... do | 822,090 | 209,701 |
| Cabrilla, fresh fillets ... do | 55,000 | 8,450 |
| Carp, smoked [3] ... do | 206,207 | 45,119 |
| Catfish and bullheads, smoked ... do | 4,100 | 825 |
| Chub, cisco, and tullibees, smoked [3] ... do | 7,616,061 | 2,023,206 |
| Cod: | | |
| Fresh fillets ... do | 11,229,478 | 1,305,840 |
| Frozen fillets ... do | 11,026,784 | 930,838 |
| Fresh sticks ... do | 251,060 | 25,469 |
| Salted: | | |
| Green ... do | [2] 5,900,219 | 300,433 |
| Dry ... do | 3,862,549 | 263,843 |
| Boneless and absolutely boneless ... do | 10,035,072 | 1,810,519 |
| Pickled ... do | 40,510 | 2,136 |
| Tongues ... do | 18,940 | 1,615 |
| Smoked ... do | 1,500 | 300 |
| Smoked, fillets ... do | 793,702 | 104,497 |
| Stockfish ... do | 22,043 | 3,013 |
| Oil: | | |
| Cod ... gallons | 7,429 | 2,889 |
| Cod-liver ... do | 275,802 | 167,572 |
| Croaker: | | |
| Fresh fillets ... pounds | 97,800 | 12,070 |
| Fresh pan-dressed ... do | 107,600 | 9,550 |
| Cusk: | | |
| Fresh fillets ... do | 919,268 | 104,772 |
| Frozen fillets ... do | 161,649 | 13,777 |
| Fresh sticks ... do | 487,319 | 54,670 |
| Salted, green ... do | [2] 42,200 | 1,633 |
| Smoked fillets ... do | 513,863 | 66,113 |
| Drum, red, smoked ... do | 200 | 50 |
| Eels: | | |
| Salted ... do | 76,550 | 6,482 |
| Smoked [3] ... do | 156,194 | 40,592 |
| Flounders: | | |
| Fresh fillets ... do | 6,324,497 | 1,038,227 |
| Frozen fillets ... do | 1,540,379 | 247,580 |
| Fresh pan-dressed ... do | 5,100 | 694 |
| Grayfish, fresh fillets ... do | 25,000 | 3,125 |
| Groupers: | | |
| Fresh fillets ... do | 167,801 | 28,906 |
| Fresh steaks ... do | 436,900 | 67,590 |
| Haddock: | | |
| Fresh fillets ... do | 17,491,840 | 2,088,705 |
| Frozen fillets ... do | 22,714,862 | 2,066,806 |
| Fresh sticks ... do | 34,472 | 6,105 |
| Salted, green ... do | [2] 201,800 | 9,063 |
| Smoked ... do | 52,900 | 9,054 |
| Finnan haddie ... do | 796,019 | 95,382 |
| Hake: | | |
| Fresh fillets ... do | 1,863,932 | 182,510 |
| Frozen fillets ... do | 431,885 | 28,467 |
| Fresh sticks ... do | 457,799 | 49,772 |
| Salted: | | |
| Green ... do | 1,204,675 | 39,028 |
| Dry ... do | 1,664,816 | 76,704 |
| Boneless ... do | 1,279,400 | 99,977 |
| Halibut: | | |
| Fresh fillets ... do | 44,608 | 13,507 |
| Frozen steaks ... do | 118,665 | 19,232 |

See footnotes at end of table.

*Manufactured fishery products of the United States and Alaska, 1937*—Continued

| Item | Quantity | Value |
|---|---|---|
| Herring, lake: | | |
|   Fresh fillets.....pounds | 229,386 | $26,570 |
|   Salted.....do | 4,573,770 | 187,440 |
|   Smoked.....do | 1,165,500 | 100,505 |
| Herring, sea: | | |
|   Salted: | | |
|     Pickled, scotch cure.....do | 2,098,040 | 107,968 |
|     Pickled and spiced.....do | 1,578,126 | 140,091 |
|     Roused.....do | 10,400 | 385 |
|     Split.....do | 232,800 | 7,084 |
|     Unclassified.....do | 1,102,642 | 64,807 |
|   Smoked: | | |
|     Bloaters, hard.....pounds | 151,220 | 5,910 |
|     Bloaters, soft.....do | 21,768 | 1,136 |
|     Bloaters, unclassified.....do | 1,125,827 | 90,894 |
|     Boneless.....do | 2,096,272 | 204,841 |
|     Lengthwise.....do | 84,845 | 4,725 |
|     Medium scaled.....do | 263,362 | 16,949 |
|     Kippered.....do | 251,738 | 34,309 |
|     Unclassified.....do | 105,000 | 10,490 |
|   Canned, "sardines".....standard cases | 1,680,241 | 4,998,373 |
|   Dry scrap.....tons | 1,452 | 40,622 |
|   Meal.....do | 20,460 | 680,382 |
|   Oil.....gallons | 5,623,045 | 2,114,548 |
| Hogchoker, salted.....pounds | 9,075 | 475 |
| King whiting, fresh fillets.....do | 1,050 | 237 |
| Lake trout: | | |
|   Fresh fillets.....do | 25,857 | 7,524 |
|   Smoked.....do | 734,534 | 242,557 |
| "Lingcod," fresh fillets.....do | 213,618 | 25,721 |
| Mackerel: | | |
|   Fresh fillets.....do | 242,640 | 31,936 |
|   Frozen fillets.....do | 111,365 | 18,407 |
|   Salted: | | |
|     Fillets.....do | 678,876 | 77,714 |
|     Split.....do | 1,122,649 | 113,283 |
|   Smoked.....do | 900,550 | 134,032 |
|   Canned.....standard cases | 840,832 | 2,673,608 |
|   Meal.....tons | 2,194 | 77,827 |
|   Oil.....gallons | 80,811 | 30,812 |
| Menhaden: | | |
|   Acid scrap.....tons | 31,600 | 618,104 |
|   Dry scrap.....do | 22,763 | 985,075 |
|   Meal.....do | 13,038 | 596,144 |
|   Oil.....gallons | 3,895,613 | 1,456,333 |
| Mooneye, smoked.....pounds | 8,200 | 1,064 |
| Mullet: | | |
|   Salted.....do | 2,715,500 | 149,193 |
|   Roe, salted.....do | 40,850 | 9,628 |
|   Smoked.....do | 32,550 | 5,599 |
| Paddlefish or spoonbill cat: | | |
|   Roe, salted [4].....do | 1,595 | 812 |
|   Smoked [3].....do | 329,100 | 132,525 |
| Pike, pickerel and sauger: | | |
|   Fresh fillets.....do | 4,215,282 | 941,436 |
|   Frozen fillets.....do | 1,025,806 | 236,244 |
|   Smoked.....do | 2,420 | 605 |
| Pilchard: | | |
|   Canned, "sardines".....standard cases | 2,812,456 | 8,592,117 |
|   Meal.....tons | 89,422 | 3,325,282 |
|   Oil.....gallons | 15,993,216 | 6,203,616 |
| Pollock: | | |
|   Fresh fillets.....pounds | 1,506,452 | 123,042 |
|   Frozen fillets.....do | 11,616,993 | 710,601 |
|   Fresh sticks.....do | 68,520 | 6,031 |
|   Salted: | | |
|     Green.....do | [3] 434,405 | 10,851 |
|     Dry.....do | 97,143 | 4,043 |
| Rockfishes, fresh fillets.....do | 1,103,298 | 163,266 |
| Rosefish: | | |
|   Fresh fillets.....do | 686,112 | 75,525 |
|   Frozen fillets.....do | 14,822,908 | 1,419,018 |
| Sablefish: | | |
|   Fresh steaks.....do | 25,000 | 3,750 |
|   Kippered.....do | 496,068 | 91,030 |
|   Pickled.....do | 190,185 | 6,794 |
|   Salted.....do | 262,375 | 14,620 |
|   Smoked [3].....do | 106,087 | 27,519 |
| Sailfish, smoked.....do | 10,000 | 2,200 |

See footnotes at end of table.

*Manufactured fishery products of the United States and Alaska, 1937*—Continued

| Item | Quantity | Value |
|---|---|---|
| Salmon: | | |
| Fresh and frozen fillets....pounds | 13,507 | $3,494 |
| Fresh and frozen steaks....do | 98,480 | 23,600 |
| Dried....do | 1,148,000 | 79,900 |
| Salted: | | |
| Dry....do | 11,725 | 1,900 |
| Mild-cured....do | 9,615,175 | 1,862,868 |
| Pickled....do | 765,396 | 100,550 |
| Eggs for caviar....do | 274,000 | 29,740 |
| Kippered....do | 1,848,896 | 401,718 |
| Kippered, canned....standard cases | 157 | 1,794 |
| Smoked [3]....pounds | 10,323,848 | 3,113,577 |
| Canned: | | |
| Blueback, red, or sockeye....standard cases | 2,176,924 | 22,475,958 |
| Chinook or king....do | 370,480 | 4,773,689 |
| Chum or keta....do | 796,829 | 3,660,357 |
| Humpback or pink....do | 3,954,169 | 19,639,749 |
| Silver or coho....do | 239,946 | 2,193,725 |
| Steelhead trout....do | 16,689 | 190,456 |
| Eggs for bait....do | 5,349 | 85,398 |
| Caviar....do | 1,534 | 36,001 |
| Meal....tons | 1,608 | 49,356 |
| Oil [5]....gallons | 167,265 | 94,122 |
| Scup or porgy: | | |
| Fresh fillets....pounds | 24,400 | 3,690 |
| Fresh pan-dressed....do | 30,500 | 2,845 |
| Sea bass: | | |
| Fresh fillets (Atlantic coast)....do | 114,800 | 18,770 |
| Black, fresh steaks (Pacific coast)....do | 250,000 | 40,000 |
| White, fresh fillets (Pacific coast)....do | 175,000 | 41,000 |
| Fresh pan-dressed (Atlantic coast)....do | 62,500 | 6,850 |
| Shad: | | |
| Smoked....do | 179,160 | 35,441 |
| Canned....standard cases | 9,219 | 30,554 |
| Roe, canned....do | 1,891 | 49,868 |
| Sharks: | | |
| Fins....pounds | 30,263 | 13,388 |
| Skins....do | 138,058 | 12,306 |
| Oil....gallons | 9,880 | 4,096 |
| Sheepshead: | | |
| Fresh fillets....pounds | 25,700 | 3,820 |
| Smoked [3]....do | 22,817 | 2,830 |
| Snapper, red: | | |
| Fresh fillets....do | 82,067 | 24,013 |
| Fresh steaks....do | 24,475 | 5,262 |
| Spanish mackerel: | | |
| Fresh fillets....do | 9,500 | 1,750 |
| Salted....do | 80,000 | 4,630 |
| Smoked....do | 300 | 75 |
| Spot, salted....do | 218,400 | 8,886 |
| Squeteagues or "sea trout": | | |
| Fresh fillets....do | 186,500 | 26,310 |
| Fresh pan-dressed....do | 344,952 | 26,046 |
| Salted....do | 20,800 | 3,120 |
| Smoked....do | 650 | 163 |
| Sturgeon: | | |
| Smoked and kippered [3]....do | 1,624,588 | 1,032,076 |
| Roe, salted [3]....do | 436 | 508 |
| Caviar, canned....standard cases | 3,053 | 435,370 |
| Swordfish, fresh and frozen steaks....pounds | 133,625 | 30,868 |
| Totuave, fresh steaks....do | 515,000 | 93,000 |
| Tuna and tunalike fishes: | | |
| Canned: | | |
| Albacore....standard cases | 114,461 | 806,391 |
| Bluefin....do | 217,251 | 1,236,324 |
| Bonito....do | 152,175 | 771,498 |
| Striped....do | 695,007 | 3,917,454 |
| "Tonno"....do | 252,857 | 1,915,779 |
| Yellowfin....do | 1,649,776 | 10,038,641 |
| Yellowtail....do | 62,974 | 309,692 |
| Meal....tons | 10,872 | 378,531 |
| Oil....gallons | 141,963 | 30,702 |
| White bass: | | |
| Fresh and frozen fillets....pounds | 6,644 | 1,215 |
| Smoked....do | 1,400 | 181 |

See footnotes at end of table.

*Manufactured fishery products of the United States and Alaska, 1937*—Continued

| Item | Quantity | Value |
|---|---|---|
| Whitefish: | | |
| Fresh and frozen fillets...pounds | 42, 971 | $12, 230 |
| Smoked [3]...do | 2, 494, 731 | 707, 809 |
| Roe, salted...do | 60 | 60 |
| Caviar, canned...standard cases | 1, 332 | 49, 395 |
| Whiting: | | |
| Fresh fillets...pounds | 458, 828 | 32, 188 |
| Frozen fillets...do | 922, 065 | 49, 710 |
| Smoked...do | 44, 874 | 6, 836 |
| Wolffish, fresh and frozen fillets...do | 93, 545 | 9, 052 |
| Yellow perch: | | |
| Fresh fillets...do | 608, 556 | 143, 232 |
| Frozen fillets...do | 42, 682 | 10, 636 |
| Crabs, hard: | | |
| Meat, packaged, fresh-cooked...do | 8, 300, 484 | 2, 822, 485 |
| Canned...standard cases | 13, 646 | 268, 634 |
| Dry scrap...tons | 1, 303 | 26, 629 |
| Crab, king: | | |
| Dry scrap...do | 535 | 19, 371 |
| Meal...do | 25 | 625 |
| Lobsters: | | |
| Common, meat, packaged, fresh-cooked...pounds | 157, 085 | 168, 290 |
| Spiny, meat, packaged, fresh-cooked...do | 92, 800 | 36, 620 |
| Shrimp: | | |
| Fresh-packaged...do | 519, 704 | 170, 520 |
| Frozen-packaged...do | 6, 567 | 2, 627 |
| Cooked and peeled...do | 924, 899 | 272, 854 |
| Sun-dried...do | 1, 384, 251 | 252, 747 |
| Canned...standard cases | 1, 286, 406 | 7, 130, 747 |
| Bran or meal...tons | 1, 452 | 33, 793 |
| Abalone steaks...pounds | 541, 000 | 165, 154 |
| Clams, hard: | | |
| Fresh-shucked...gallons | 56, 500 | 89, 298 |
| Canned: | | |
| Whole...standard cases | 30, 019 | 144, 012 |
| Minced...do | 32, 777 | 178, 835 |
| Chowder...do | 419, 622 | 1, 468, 476 |
| Juice...do | 12, 751 | 44, 376 |
| Broth, bouillon, and cocktail...do | 7, 935 | 36, 243 |
| Shells, ground, poultry feed...tons | 1, 050 | 9, 100 |
| Clams, razor: | | |
| Fresh-shucked...gallons | 37, 467 | 15, 107 |
| Canned: | | |
| Whole...standard cases | 1, 529 | 13, 021 |
| Minced...do | 42, 259 | 367, 281 |
| Clams, soft: | | |
| Fresh-shucked...gallons | 5, 928, 956 | 699, 721 |
| Canned: | | |
| Whole...standard cases | 135, 197 | 489, 806 |
| Chowder...do | 76, 051 | 240, 109 |
| Juice...do | 14, 116 | 25, 769 |
| Steamed...pounds | [2] 157, 220 | 14, 801 |
| Clams, mixed, fresh-shucked...gallons | 75, 644 | 10, 374 |
| Marine-shell products: | | |
| Buttons...gross | 6, 732, 051 | 4, 316, 961 |
| Novelties... | ... | 762, 934 |
| Mussel, fresh-water, shell products: | | |
| Buttons...gross | 17, 145, 649 | 4, 732, 918 |
| Poultry feed...tons | 4, 450 | 27, 427 |
| Lime...do | 1, 026 | 1, 448 |
| Oysters: | | |
| Eastern: | | |
| Fresh-shucked...gallons | 54, 790, 881 | 8, 440, 142 |
| Canned...standard cases | 598, 078 | 2, 462. 322 |
| Soup, canned...do | 32, 961 | 182, 518 |
| Japanese: | | |
| Fresh-shucked...gallons | 3, 109, 855 | 431, 246 |
| Canned...standard cases | 110, 872 | 470, 359 |
| Western, fresh-shucked...gallons | 233, 179 | 209, 182 |
| Shell products: | | |
| Poultry feed...tons | 292, 273 | 1, 241, 702 |
| Lime and dust...do | 75, 893 | 270, 202 |
| Lime, burned...do | 13, 098 | 89, 119 |

**See footnotes at end of table.**

*Manufactured fishery products of the United States and Alaska, 1937*—Continued

| Item | Quantity | Value |
|---|---|---|
| Scallops, bay, fresh-shucked gallons | 166,872 | $466,683 |
| Scallops, sea, fresh-shucked do | 720,957 | 720,648 |
| Alligator hides [4] pounds | 88,356 | 7,363 |
| Terrapin products, canned standard cases | 136 | 8,715 |
| Turtle products, canned do | 5,824 | 73,737 |
| Whale products: | | |
| Meal (meat) tons | 770 | 25,410 |
| Meal (bone) do | 435 | 7,395 |
| Oil, whale gallons | 9,052,202 | 4,122,669 |
| Oil, sperm do | 174,087 | 47,332 |
| Unclassified products: | | |
| Fillets, fresh pounds | [6] 76,155 | [6] 12,753 |
| Fillets, frozen do | [7] 205,249 | [7] 31,747 |
| Pan-dressed, fresh do | [8] 101,400 | [8] 6,240 |
| Miscellaneous, packaged, fresh and frozen do | [9] 1,186,455 | [9] 88,356 |
| Salted do | [10] 875,748 | [10] 107,065 |
| Smoked do | [11] 84,435 | [11] 9,665 |
| Canned: | | |
| Fish for cat and dog food standard cases | 377,041 | 840,307 |
| Fish cakes, balls, etc do | 109,285 | 754,770 |
| Fish chowder do | 2,099 | 12,557 |
| Fish flakes do | 39,880 | 353,071 |
| Fish paste do | 3,696 | 137,624 |
| Other do | [12] 16,762 | [12] 144,948 |
| Acid, dry, and green scrap tons | [13] 1,537 | [13] 35,314 |
| Meal: | | |
| Ground fish (white fish) do | 14,178 | 396,995 |
| Miscellaneous do | [14] 5,548 | [14] 237,353 |
| Oil: | | |
| Fur seal gallons | 29,341 | 5,397 |
| Liver, miscellaneous do | [15] 72,119 | [15] 2,036,525 |
| Miscellaneous do | [16] 99,446 | [16] 36,066 |
| Glue do | 441,912 | 908,121 |
| Other byproducts | | [17] 497,132 |
| Total, fresh and frozen packaged products pounds | 201,802,529 | 27,677,899 |
| Total, cured products do | 104,339,340 | 15,635,280 |
| Total, canned products do | 742,197,065 | 105,174,935 |
| Total, byproducts | | 36,804,045 |
| Grand total | | 185,292,159 |

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[1] All data are for 1937 except for a small quantity of salted and smoked fish produced in the Mississippi River section which are for 1931.

[2] This is usually an intermediate product and although shown in the total may also be shown in its final stage of processing elsewhere in the table.

[3] Data are for 1937 and 1931.

[4] Data are for 1931.

[5] Includes the production of both edible and industrial salmon oils.

[6] Includes fresh fillets of carp, red drum, kingfish or "king mackerel," mullet, muttonfish, sea robin, snook or sergeantfish, striped bass, and suckers.

[7] Includes frozen fillets of bluefish, croaker, halibut, king whiting or "kingfish," lake trout, "lingcod," Spanish mackerel, spot, and squeteagues or "sea trout."

[8] Includes fresh pan-dressed red drum, Spanish mackerel, and whiting.

[9] Includes fresh steaks of cabio, cod, haddock, halibut, mackerel, pollock, and snook or sergeantfish; frozen steaks of cod, pollock, and wolffish; and fresh sticks of whiting.

[10] Includes salted barracuda, haddock, lake trout, pilchard, black and white sea bass, tenpounder, tuna, yellowtail, fillets of cod, hake, and Spanish mackerel, boneless cusks; king whiting or "kingfish" roe, and salmon bellies; spiced anchovies, chub, mackerel, and oyster and shrimp cocktail; pickled eels, and sea-herring roe.

[11] Includes smoked goldeye, hake, scup or porgy, miscellaneous fish, and fillets of haddock, hake, sea herring, and pollock.

[12] Includes canned salted cod, pickled eels, finnan haddie, kippered sturgeon, tuna roe, fish bouillon, soft crabs, spiny lobster or "sea crawfish" soup, shrimp soup, hard-clam stew, razor-clam juice, soft-clam cakes, coquina clam broth, pickled sea mussels, squid, frog products, deep-sea roe, rat poison bait, and crab and shrimp gumbo.

[13] Includes shark and miscellaneous dry scrap; alewife acid scrap; and sea herring and miscellaneous green scrap.

[14] Includes salmon-egg, shark, soft-clam, starfish, cod-liver, and miscellaneous fish meals.

[15] Includes burbot, halibut, sablefish, shark, swordfish, and tuna liver oils.

[16] Includes blackfish, rosefish, and miscellaneous fish oils.

[17] Includes isinglass, kelp products, pearl essence, clam-shell lime, miscellaneous novelties, and fresh-water mussel-shell novelties, stucco, and chips.

NOTE.—Some of the above products have been manufactured from raw products imported from another country; therefore, they cannot be correlated directly with the catch within the United States and Alaska.

## CANNED FISHERY PRODUCTS AND BYPRODUCTS TRADE

The output of canned fishery products and byproducts in the United States and Alaska in 1937 was valued at $141,978,980. Of this total, canned products comprised $105,174,935, and byproducts, $36,804,045—an increase of 11 percent in the value of canned products and 5 percent in the value of byproducts when compared with the respective values of the same groups of commodities for the previous year.

Fishery products were canned at 405 establishments in the United States and Alaska during 1937. The combined output of these canneries amounted to 19,530,809 standard cases. The net weight of the products canned amounted to 742,197,065 pounds.

Canned fishery products or byproducts were prepared in 26 States and in Alaska during 1937. Alaska ranked first in the value of the products, accounting for 34 percent of the total, and California ranked second, with 29 percent.

*Canned fishery products and byproducts of the United States and Alaska, 1937*

SUMMARY OF PRODUCTION: BY COMMODITIES

| Product | Number of plants | Standard cases | Pounds | Value |
|---|---|---|---|---|
| Canned products: | | | | |
| Salmon: | | | | |
| United States | 28 | 885, 372 | 42, 497, 856 | $8, 386, 165 |
| Alaska | 113 | 6, 669, 665 | 320, 143, 920 | 44, 547, 769 |
| Sardines: | | | | |
| Maine | 25 | 1, 680, 241 | 42, 006, 025 | 4, 998, 373 |
| California | 34 | 2, 812, 456 | 134, 997, 888 | 8, 592, 117 |
| Tuna and tunalike fishes | 19 | 3, 144, 501 | 75, 468, 024 | 18, 995, 779 |
| Mackerel | 28 | 840, 832 | 40, 359, 936 | 2, 673, 608 |
| Alewives | 11 | 54, 993 | 2, 639, 664 | 139, 585 |
| Alewife roe | 32 | 51, 272 | 2, 461, 056 | 304, 922 |
| Shad | 9 | 9, 219 | 442, 512 | 30, 554 |
| Shad roe | 8 | 1, 891 | 90, 768 | 49, 868 |
| Cat and dog food | 9 | 377, 041 | 18, 097, 968 | 840, 307 |
| Fish flakes | 4 | 39, 880 | 1, 914, 240 | 353, 071 |
| Fish cakes, balls, etc | 8 | 109, 285 | 5, 245, 680 | 754, 770 |
| Fish paste | 4 | 3, 696 | 177, 408 | 137, 624 |
| Sturgeon caviar | 4 | 3, 053 | 146, 544 | 435, 370 |
| Whitefish roe and caviar | 5 | 1, 332 | 63, 936 | 49, 395 |
| Salmon roe and caviar (for food) | 4 | 1, 534 | 73, 632 | 36, 001 |
| Salmon eggs (for bait) | 10 | 5, 349 | 256, 752 | 85, 398 |
| Miscellaneous fish and roe | 15 | 11, 194 | 537, 312 | 101, 586 |
| Clam products | 54 | [1] 773, 448 | 19, 576, 725 | 3, 013, 446 |
| Oysters | 51 | 708, 950 | 10, 634, 250 | 2, 932, 681 |
| Oyster soup | 3 | 32, 961 | 1, 582, 128 | 182, 518 |
| Shrimp | 61 | 1, 286, 406 | 21, 523, 417 | 7, 130, 747 |
| Crabs | 18 | 13, 697 | 657, 456 | 269, 699 |
| Terrapin products | 4 | 136 | 6, 528 | 8, 715 |
| Turtle products | 3 | 5, 824 | 279, 552 | 73, 737 |
| Miscellaneous shellfish | 9 | 6, 581 | 315, 888 | 51, 130 |
| Total | [2] 405 | 19, 530, 809 | 742, 197, 065 | 105, 174, 935 |
| Byproducts: | | | *Quantity* | |
| Oyster and marine clam-shell products | | tons | 382, 718 | 1, 612, 847 |
| Fresh-water mussel-shell products | | | | 4, 791, 205 |
| Marine pearl-shell products | | | | 5, 079, 895 |
| Scrap, meal, etc | | tons | 219, 942 | 7, 565, 535 |
| Marine-animal oils | | gallons | 35, 634, 669 | 16, 355, 752 |
| Miscellaneous byproducts | | | | 1, 398, 811 |
| Total | | | | 36, 804, 045 |
| Grand total | | | | 141, 978, 980 |

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[1] "Cut-out" or "drained" weights of can contents are included for whole or minced clams, and gross can contents for other clam products.

[2] Exclusive of duplication.

*Canned fishery products and byproducts of the United States and Alaska, 1937*—Con.

VALUE OF PRODUCTION: BY STATES

| State | Canned products | Byproducts | Total |
|---|---|---|---|
| Maine | $6,022,341 | $460,700 | $6,483,041 |
| Massachusetts | 1,135,187 | 2,129,293 | 3,286,134 |
| Rhode Island | | 21,654 | |
| Connecticut | | 1,195,087 | 1,195,087 |
| New York | 702,709 | 6,079,398 | 6,782,107 |
| New Jersey | 1,411,385 | 1,946,263 | 3,574,146 |
| Pennsylvania | | 216,498 | |
| Delaware | | 549,810 | 549,810 |
| Maryland | 621,448 | 1,216,002 | 1,837,450 |
| Virginia | 188,760 | 1,524,306 | 1,713,066 |
| North Carolina | 116,116 | 778,775 | 1,323,453 |
| South Carolina | 428,562 | | |
| Georgia | 716,861 | 952,042 | 2,181,627 |
| Florida | 512,724 | | |
| Alabama | 375,167 | 81,721 | 3,440,003 |
| Mississippi | 2,983,115 | | |
| Louisiana | 4,347,599 | 366,393 | 4,713,992 |
| Texas, Illinois, Missouri, Wisconsin, and Minnesota | 389,080 | 215,380 | 604,460 |
| Iowa | | 3,719,580 | 3,719,580 |
| Washington | 5,276,928 | 1,646,841 | 6,923,769 |
| Oregon | 4,163,681 | 456,653 | 4,620,334 |
| California | 30,741,773 | 9,975,414 | 40,717,187 |
| Alaska | 45,041,499 | 3,272,235 | 48,313,734 |
| Total | 105,174,935 | 36,804,045 | 141,978,980 |

PACK OF CANNED SALMON: STANDARD CASES

| Product | Alaska | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Southeastern | | Central | | Western | | Total | |
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| Chinook or king: | | | | | | | | |
| 1-pound tall | 24,981 | $212,802 | 17,443 | $149,468 | 5,336 | $42,453 | 47,760 | $404,723 |
| 1-pound flat | 1,794 | 17,222 | 3,409 | 43,396 | 1,010 | 13,130 | 6,213 | 73,748 |
| ½-pound flat | 3,918 | 52,109 | 10,792 | 148,655 | 785 | 11,304 | 15,495 | 212,068 |
| Total | 30,693 | 282,133 | 31,644 | 341,519 | 7,131 | 66,887 | 69,468 | 690,539 |
| Blueback, red, or sockeye: | | | | | | | | |
| 1-pound tall | 103,269 | 1,018,890 | 312,158 | 3,038,350 | 1,450,749 | 14,294,077 | 1,866,176 | 18,351,317 |
| 1-pound flat | 8,694 | 95,634 | 78,046 | 855,594 | 914 | 10,054 | 87,654 | 961,282 |
| ½-pound flat | 55,781 | 759,456 | 68,622 | 892,874 | 25,021 | 315,271 | 149,424 | 1,967,601 |
| 4-pound flat | | | 3,415 | 33,638 | | | 3,415 | 33,638 |
| Total | 167,744 | 1,873,980 | 462,241 | 4,820,456 | 1,476,684 | 14,619,402 | 2,106,669 | 21,313,838 |
| Silver or coho: | | | | | | | | |
| 1-pound tall | 78,328 | 631,983 | 45,144 | 349,122 | 138 | 1,030 | 123,610 | 982,135 |
| 1-pound flat | 1,008 | 9,060 | 196 | 1,568 | | | 1,204 | 10,628 |
| ½-pound flat | 9,189 | 97,464 | 436 | 3,944 | | | 9,625 | 101,408 |
| 4-pound flat | | | 2,878 | 23,744 | | | 2,878 | 23,744 |
| Total | 88,525 | 738,507 | 48,654 | 378,378 | 138 | 1,030 | 137,317 | 1,117,915 |
| Humpback or pink: | | | | | | | | |
| 1-pound tall | 2,111,246 | 10,544,503 | 1,475,658 | 7,251,025 | 1 | 5 | 3,586,905 | 17,795,533 |
| 1-pound flat | 420 | 2,016 | 18 | 90 | | | 438 | 2,106 |
| ½-pound flat | 31,502 | 216,669 | 1,836 | 12,155 | | | 33,338 | 228,824 |
| 4-pound flat | | | 4,698 | 23,020 | | | 4,698 | 23,020 |
| Total | 2,143,168 | 10,763,188 | 1,482,210 | 7,286,290 | 1 | 5 | 3,625,379 | 18,049,483 |
| Chum or keta: | | | | | | | | |
| 1-pound tall | 501,093 | 2,303,746 | 187,266 | 866,211 | 35,456 | 165,033 | 723,815 | 3,334,990 |
| 1-pound flat | 39 | 140 | | | | | 39 | 140 |
| ½-pound flat | 2,634 | 16,491 | 3,249 | 19,993 | | | 5,883 | 36,484 |
| 4-pound flat | | | 1,095 | 4,380 | | | 1,095 | 4,380 |
| Total | 503,766 | 2,320,377 | 191,610 | 890,584 | 35,456 | 165,033 | 730,832 | 3,375,994 |
| Grand total | 2,933,896 | 15,978,185 | 2,216,359 | 13,717,227 | 1,519,410 | 14,852,357 | 6,669,665 | 44,547,769 |

*Canned fishery products and byproducts of the United States and Alaska, 1937*—Con.

PACK OF CANNED SALMON: STANDARD CASES—Continued

| Product | United States | | | | | | Grand total, Alaska and United States | |
|---|---|---|---|---|---|---|---|---|
| | Washington | | Oregon | | Total | | | |
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| Chinook or king: | | | | | | | | |
| 1-pound tall | 16,756 | $127,923 | 10,113 | $61,260 | 26,869 | $189,183 | 74,629 | $593,906 |
| 1-pound oval | 23 | 529 | 645 | 14,835 | 668 | 15,364 | 668 | 15,364 |
| 1-pound flat | 24,394 | 281,779 | 39,411 | 433,861 | 63,805 | 715,640 | 70,018 | 789,388 |
| ½-pound oval | 4 | 104 | 474 | 12,324 | 478 | 12,428 | 478 | 12,428 |
| ½-pound flat | 45,991 | 671,425 | 140,083 | 2,097,129 | 186,074 | 2,768,554 | 201,569 | 2,980,622 |
| ¼-pound flat | 154 | 1,720 | 22,964 | 380,261 | 23,118 | 381,981 | 23,118 | 381,981 |
| Total | 87,322 | 1,083,480 | 213,690 | 2,999,670 | 301,012 | 4,083,150 | 370,480 | 4,773,689 |
| Blueback, red, or sockeye: | | | | | | | | |
| 1-pound tall | 198 | 2,178 | | | 198 | 2,178 | 1,866,374 | 18,353,495 |
| 1-pound flat | 5,913 | 82,782 | | | 5,913 | 82,782 | 93,567 | 1,044,064 |
| ½-pound flat | 58,851 | 984,866 | 4,248 | 73,066 | 63,099 | 1,057,932 | 212,523 | 3,025,533 |
| ¼-pound flat | 222 | 4,085 | 823 | 15,143 | 1,045 | 19,228 | 1,045 | 19,228 |
| 4-pound flat | | | | | | | 3,415 | 33,638 |
| Total | 65,184 | 1,073,911 | 5,071 | 88,209 | 70,255 | 1,162,120 | 2,176,924 | 22,475,958 |
| Silver or coho: | | | | | | | | |
| 1-pound tall | 3,745 | 31,360 | 3,390 | 27,120 | 7,135 | 58,480 | 130,745 | 1,040,615 |
| 1-pound flat | 9,003 | 84,628 | 18,006 | 169,256 | 27,009 | 253,884 | 28,213 | 264,512 |
| ½-pound oval | | | 294 | 4,116 | 294 | 4,116 | 294 | 4,116 |
| ½-pound flat | 26,209 | 283,057 | 32,454 | 350,503 | 58,663 | 633,560 | 68,288 | 734,968 |
| ¼-pound flat | | | 9,528 | 125,770 | 9,528 | 125,770 | 9,528 | 125,770 |
| 4-pound flat | | | | | | | 2,878 | 23,744 |
| Total | 38,957 | 399,045 | 63,672 | 676,765 | 102,629 | 1,075,810 | 239,946 | 2,193,725 |
| Humpback or pink: | | | | | | | | |
| 1-pound tall | 304,271 | 1,430,074 | | | 304,271 | 1,430,074 | 3,891,176 | 19,225,607 |
| 1-pound flat | 4,669 | 25,212 | | | 4,669 | 25,212 | 5,107 | 27,318 |
| ½-pound flat | 19,850 | 134,980 | | | 19,850 | 134,980 | 53,188 | 363,804 |
| 4-pound flat | | | | | | | 4,698 | 23,020 |
| Total | 328,790 | 1,590,266 | | | 328,790 | 1,590,266 | 3,954,169 | 19,639,749 |
| Chum or keta: | | | | | | | | |
| 1-pound tall | 33,342 | 143,688 | 30,519 | 127,486 | 63,861 | 271,174 | 787,676 | 3,606,164 |
| 1-pound flat | 35 | 182 | | | 35 | 182 | 74 | 322 |
| ½-pound flat | 1,148 | 7,289 | 953 | 5,718 | 2,101 | 13,007 | 7,984 | 49,491 |
| 4-pound flat | | | | | | | 1,095 | 4,380 |
| Total | 34,525 | 151,159 | 31,472 | 133,204 | 65,997 | 284,363 | 796,829 | 3,660,357 |
| Steelhead: | | | | | | | | |
| 1-pound tall | 842 | 5,894 | 617 | 4,319 | 1,459 | 10,213 | 1,459 | 10,213 |
| 1-pound flat | 1,164 | 10,476 | 1,939 | 17,451 | 3,103 | 27,927 | 3,103 | 27,927 |
| ½-pound oval | | | 1,516 | 23,043 | 1,516 | 23,043 | 1,516 | 23,043 |
| ½-pound flat | 616 | 6,653 | 4,754 | 51,343 | 5,370 | 57,996 | 5,370 | 57,996 |
| ¼-pound flat | 901 | 12,253 | 4,340 | 59,024 | 5,241 | 71,277 | 5,241 | 71,277 |
| Total | 3,523 | 35,276 | 13,166 | 155,180 | 16,689 | 190,456 | 16,689 | 190,456 |
| Grand total | 558,301 | 4,333,137 | 327,071 | 4,053,028 | 885,372 | 8,386,165 | 7,555,037 | 52,933,934 |

NOTE.—"Standard cases" represents the various-sized cases converted to the equivalent of 48 1-pound cans to the case. Salmon were canned at 21 plants in Washington, 7 in Oregon, and 113 in Alaska.

*Canned fishery products and byproducts of the United States and Alaska, 1937*—Con.

## PACK OF CANNED SARDINES

| Sardines (herring) | Maine | |
|---|---|---|
| | *Cases* | *Value* |
| Quarters, ¼-pound (100 cans): | | |
| In olive oil | 6,778 | $36,344 |
| In cottonseed oil | 1,458,086 | 4,371,322 |
| In mustard | 106,156 | 334,610 |
| In tomato sauce | 20,409 | 66,052 |
| Three-quarters, ¾-pound (48 cans): | | |
| In mustard | 61,675 | 190,045 |
| Total | 1,653,104 | 4,998,373 |
| Total (standard cases) | 1,680,241 | |

| Sardines (pilchard) | California | |
|---|---|---|
| | *Cases* | *Value* |
| 1-pound: | | |
| Oval: | | |
| In mustard (48 cans) | 256,244 | $791,496 |
| In tomato sauce (48 cans) | 1,093,991 | 3,350,525 |
| In natural oil (48 cans) | 52,567 | 158,984 |
| In other sauces or oils (48 cans) | 16,061 | 54,610 |
| Tall: | | |
| In tomato sauce (48 cans) | 14,767 | 34,799 |
| In natural oil (48 cans) | 857,800 | 2,169,469 |
| ½-pound: | | |
| Oval: | | |
| In natural oil (96 cans) | 18,496 | 59,167 |
| In other sauces or oils (48 cans) | 817 | 2,379 |
| Square and oblong: | | |
| In various sauces and oils (48 cans) | 43,279 | 132,939 |
| Other: | | |
| In natural oil (96 cans) | 277,886 | 892,214 |
| In other sauces or oils (48 cans) | 34,441 | 96,732 |
| 5-ounce eastern oyster: | | |
| In tomato sauce (100 cans) | 51,986 | 167,453 |
| In natural oil (100 cans) | 224,189 | 644,115 |
| Other sizes: | | |
| In various sauces or oils (standard cases) | 5,585 | 37,235 |
| Total | 2,948,109 | 8,592,117 |
| Total (standard cases) | 2,812,456 | |

NOTE.—"Standard cases" represents the various-sized cases converted to the uniform basis of 100 ¼-pound cans to the case of sardines (herring), and 48 1-pound cans to the case of sardines (pilchard). Sardines were canned at 25 plants in Maine and 34 in California.

## PACK OF CANNED TUNA AND TUNALIKE FISHES IN CALIFORNIA [3]

| Product and size | Albacore | | Yellowfin | | Bluefin | | Striped | |
|---|---|---|---|---|---|---|---|---|
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| ¼-pound (48 cans) | 213 | $931 | 187,581 | $798,198 | 23,238 | $97,659 | 41,850 | $158,776 |
| ½-pound (48 cans) | 79,352 | 592,520 | 1,116,820 | 6,899,728 | 149,560 | 856,695 | 591,091 | 3,338,453 |
| 1-pound (48 cans) | [4] 9,625 | [4] 130,044 | [4] 114,056 | [4] 1,268,189 | 15,891 | 159,224 | 30,479 | 309,092 |
| Total (actual cases) | 89,190 | 723,495 | 1,418,457 | 8,966,115 | 188,689 | 1,113,578 | 663,420 | 3,806,321 |
| Total (standard cases) | 98,708 | | 1,438,722 | | 192,961 | | 672,974 | |
| Flakes: | | | | | | | | |
| ½-pound (48 cans) | 9,983 | 54,784 | [5] 156,907 | [5] 819,337 | 17,516 | 91,477 | 16,097 | 83,372 |
| 1-pound (48 cans) | 2,885 | 28,112 | [6] 27,073 | [6] 253,189 | [6] 3,387 | [6] 31,269 | 2,968 | 27,761 |
| Total (actual cases) | 12,868 | 82,896 | 183,980 | 1,072,526 | 20,903 | 122,746 | 19,065 | 111,133 |
| Total (standard cases) | 15,753 | | 211,054 | | 24,290 | | 22,033 | |
| Grand total (actual cases) | 102,058 | 806,391 | 1,602,437 | 10,038,641 | 209,592 | 1,236,324 | 682,485 | 3,917,454 |
| Grand total (standard cases) | 114,461 | | 1,649,776 | | 217,251 | | 695,007 | |

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[3] Includes the Washington, Oregon, and Massachusetts pack of albacore and bluefin tuna, amounting to 15,143 standard cases, valued at $118,762.

[4] Includes the pack in 4-pound cans, 12 to the case, which has been converted to the equivalent of 1-pound cans, 48 to the case.

[5] Includes the pack in ¼-pound cans, 48 to the case, which has been converted to the equivalent of ½ pound cans, 48 to the case.

[6] Includes the pack of creamed tuna in ¾-pound cans, 48 to the case, which has been converted to the equivalent of 1-pound cans, 48 to the case.

*Canned fishery products and byproducts of the United States and Alaska, 1937*—Con.

## PACK OF CANNED TUNA AND TUNALIKE FISHES IN CALIFORNIA—Continued

| Product and size | "Tonno" | | Bonito | | Yellowtail | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| ¼-pound (48 cans) | ------- | ---------- | (7) | (7) | (7) | (7) | 252,882 | $1,055,564 |
| ¼-pound (100 cans) | 223,353 | $1,763,812 | (7) | (7) | ------- | --------- | 223,353 | 1,763,812 |
| ½-pound (48 cans) | 20,213 | 151,967 | [7] 104,969 | [7] $550,478 | [7] 30,946 | [7] $159,353 | 2,092,951 | 12,549,194 |
| 1-pound (48 cans) | ------- | ---------- | 23,603 | 221,020 | 16,014 | 150,339 | 209,668 | 2,237,908 |
| Total (actual cases) | 243,566 | 1,915,779 | 128,572 | 771,498 | 46,960 | 309,692 | 2,778,854 | 17,606,478 |
| Total (standard cases) | 252,857 | ---------- | 152,175 | ---------- | 62,974 | --------- | 2,871,371 | ---------- |
| Flakes: | | | | | | | | |
| ½-pound (48 cans) | ------- | ---------- | ------- | ---------- | ------- | --------- | 200,503 | 1,048,970 |
| 1-pound (48 cans) | ------- | ---------- | ------- | ---------- | ------- | --------- | 36,313 | 340,331 |
| Total (actual cases) | ------- | ---------- | ------- | ---------- | ------- | --------- | 236,816 | 1,389,301 |
| Total (standard cases) | ------- | ---------- | ------- | ---------- | ------- | --------- | 273,130 | ---------- |
| Grand total (actual cases) | 243,566 | 1,915,779 | 128,572 | 771,498 | 46,960 | 309,692 | 3,015,670 | 18,995,779 |
| Grand total (standard cases) | 252,857 | ---------- | 152,175 | ---------- | 62,974 | --------- | 3,144,501 | ---------- |

[7] The pack in ¼-pound cans, 48 and 100 to the case, has been converted to the equivalent of ½-pound cans, 48 to the case.

NOTE.—"Standard cases" represents the various-sized cases converted to the equivalent of 48 ½-pound cans to the case. Tuna and tunalike fishes were canned at 15 plants in California, 1 in Washington, 2 in Oregon, and 1 in Massachusetts.

## PACK OF CANNED MACKEREL

| Size | Cases | Value |
|---|---|---|
| 8-ounce (48 cans) | 8,724 | $29,576 |
| 8-ounce (96 cans) | 13,405 | 48,850 |
| 16-ounce (48 cans) | [8] 821,621 | [8] 2,578,137 |
| Other sizes (standard cases) | 1,444 | 17,045 |
| Total (actual cases) | 845,194 | 2,673,608 |
| Total (standard cases) | 840,832 | ---------- |

[8] Includes a small amount of mackerel chowder.

NOTE.—"Standard cases" represents the various-sized cans converted to the equivalent of 48 1-pound cans to the case. Mackerel were canned at 2 plants in Massachusetts and 26 in California.

## PACK OF CANNED ALEWIVES AND ALEWIFE ROE: STANDARD CASES

| Product | Maine and North Carolina | | Maryland | | Virginia | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| Alewives | ------- | ---------- | 35,511 | $84,527 | 19,482 | $55,058 | 54,993 | $139,585 |
| Alewife roe | 13,012 | $87,185 | 15,030 | 86,535 | 23,230 | 131,202 | 51,272 | 304,922 |
| Total | 13,012 | 87,185 | 50,541 | 171,062 | 42,712 | 186,260 | 106,265 | 444,507 |

## PACK OF CANNED ALEWIVES AND ALEWIFE ROE: ACTUAL CASES

| Product and size | Cases | Value |
|---|---|---|
| Alewives: | | |
| 14, 16, 17, and 19 ounces (24 cans) | [9] 83,178 | [9] $89,540 |
| 26 and 28 ounces (24 cans) | [10] 20,852 | [10] 50,045 |
| Total | ------------- | 139,585 |
| Alewife roe: | | |
| 8 and 10 ounces (48 cans) | [11] 47,231 | [11] 153,032 |
| 16, 17, and 19 ounces (24 cans) | [12] 51,373 | [12] 151,890 |
| Total | ------------- | 304,922 |
| Grand total | ------------- | 444,507 |

[9] Consist principally of 14- and 16-ounce cans. Includes 5,957 cases of 48 cans to the case.
[10] Consist principally of 26-ounce cans.
[11] Consist principally of 8-ounce cans.
[12] Consist principally of 17-ounce cans.

NOTE.—"Standard cases" represents the various-sized cases converted to the equivalent of 48 1-pound cans to the case. Alewives or alewife roe were canned at 1 plant in Maine, 7 in Maryland, 19 in Virginia, and 5 in North Carolina.

*Canned fishery products and byproducts of the United States and Alaska, 1937*—Con.

### PACK OF CANNED OYSTERS: STANDARD CASES

| State | Cases | Value |
|---|---|---|
| Maryland, North Carolina, and Georgia | 14, 879 | $61, 190 |
| South Carolina | 98, 872 | 428, 562 |
| Florida | 14, 536 | 60, 890 |
| Alabama | 31, 561 | 132, 256 |
| Mississippi | 321, 964 | 1, 316, 664 |
| Louisiana | 116, 266 | 462, 760 |
| Washington and Oregon | 110, 872 | 470, 359 |
| Total | 708, 950 | 2, 932, 681 |

### PACK OF CANNED OYSTERS: ACTUAL CASES

| Size | Cases | Value |
|---|---|---|
| 3½-ounce (48 cans) | [13] 20, 204 | [13] $66, 911 |
| 4-ounce (48 cans) | 19, 931 | 74, 742 |
| 5-ounce (48 cans) | 545, 614 | 2, 238, 013 |
| 6-ounce (48 cans) | 349 | 1, 909 |
| 8-ounce (24 cans) | 9, 959 | 38, 459 |
| 8-ounce (48 cans) | 45, 955 | 298, 860 |
| 10-ounce (24 cans) | 51, 336 | 213, 787 |
| Total | | 2, 932, 681 |

[13] Includes the pack in 2-ounce cans, 100 to a case, which has been converted to the equivalent of 3½-ounce cans, 48 to the case.

NOTE.—"Standard cases" represents the various-sized cases converted to the equivalent of 48 5-ounce cans to the case. Oysters were canned at 1 plant in Maryland, 1 in North Carolina, 5 in South Carolina, 1 in Georgia, 4 in Florida, 3 in Alabama, 14 in Mississippi, 12 in Louisiana, 9 in Washington, and 1 in Oregon. The pack of oyster soup has not been included in the pack of oysters but has been shown under "Pack of miscellaneous canned fishery products."

### PACK OF CANNED CLAMS AND CLAM PRODUCTS: STANDARD CASES

| Product and State | Whole | | Minced | | Chowder | |
|---|---|---|---|---|---|---|
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| Soft clams: | | | | | | |
| Maine, Massachusetts, New Jersey, and Illinois | [15] 135, 197 | [15] $489, 806 | | | [16] 76, 051 | [16] $240, 109 |
| Hard clams: | | | | | | |
| New Jersey | | | | | 176, 871 | 636, 607 |
| Maryland | | | | | 37, 613 | 84, 681 |
| Washington | 25, 339 | 108, 785 | 22, 397 | $106, 443 | 30 | 206 |
| Alaska | 411 | 2, 845 | 17 | 132 | | |
| Massachusetts, Rhode Island, New York, Pennsylvania, and Florida | [18] 4, 269 | [18] 32, 382 | [18] 10, 363 | [18] 72, 260 | 205, 249 | 748, 346 |
| Total | 30, 019 | 144, 012 | 32, 777 | 178, 835 | 419, 763 | 1, 469, 840 |
| Razor clams: | | | | | | |
| Washington | 1, 246 | 10, 466 | 14, 334 | 120, 767 | | |
| Oregon | 117 | 936 | 1, 288 | 10, 718 | | |
| Alaska | 166 | 1, 619 | 26, 637 | 235, 796 | | |
| Total | 1, 529 | 13, 021 | 42, 259 | 367, 281 | | |
| Grand total | 166, 745 | 646, 839 | 75, 036 | 546, 116 | 495, 814 | 1, 709, 949 |

[15] Packed in Maine and New Jersey.
[16] Packed in Maine, Massachusetts, and Illinois.
[18] Packed in New York and Florida.

*Canned fishery products and byproducts of the United States and Alaska, 1937*—Con.

PACK OF CANNED CLAMS AND CLAM PRODUCTS: STANDARD CASES—Continued

| Product and State | Juice, broth, and cocktail[14] | | Total | |
|---|---|---|---|---|
| | *Cases* | *Value* | *Cases* | *Value* |
| Soft clams: | | | | |
| Maine, Massachusetts, New Jersey, and Illinois | 14,116 | $25,769 | 225,364 | $755,684 |
| Hard clams: | | | | |
| New Jersey | (17) | (17) | 176,871 | 636,607 |
| Maryland | | | 37,613 | 84,681 |
| Washington | 5,305 | 11,565 | 53,071 | 226,999 |
| Alaska | | | 428 | 2,977 |
| Massachusetts, Rhode Island, New York, Pennsylvania, and Florida | [17] 16,331 | [17] 72,804 | 236,212 | 925,792 |
| Total | 21,636 | 84,369 | 504,195 | 1,877,056 |
| Razor clams: | | | | |
| Washington | | | 15,580 | 131,233 |
| Oregon | 101 | 404 | 1,506 | 12,058 |
| Alaska | | | 26,803 | 237,415 |
| Total | 101 | 404 | 43,889 | 380,706 |
| Grand total | 35,853 | 110,542 | 773,448 | 3,013,446 |

[14] Consists of juice from soft clams in Maine; juice from hard clams in New York, Florida, and Washington; broth from hard clams in New York, New Jersey, and Florida; cocktail from hard clams in New York and Florida; juice from razor clams in Oregon; and broth from coquina clams in Florida. The latter item has been included with the New York, New Jersey, and Florida production of hard clam juice, broth, and cocktail.

[17] A small pack of hard-clam broth in New Jersey has been included with the New York and Florida production.

PACK OF CANNED CLAMS AND CLAM PRODUCTS: ACTUAL CASES

| Product and size | Whole | | Minced | | Chowder | |
|---|---|---|---|---|---|---|
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| Soft clams: | | | | | | |
| No. 1 (48 cans) | 99,669 | $354,228 | | | 19,485 | $70,263 |
| 1-pound (24 cans) | | | | | 11,945 | 29,887 |
| 1-pound (48 cans) | 11,849 | 75,203 | | | | |
| No. 2 (24 cans) | 15,160 | 54,569 | | | | |
| No. 2½ (24 cans) | | | | | 26,812 | 109,490 |
| No. 3 (24 cans) | | | | | 1,384 | 4,735 |
| Other sizes (standard cases) | 1,410 | 5,806 | | | 8,532 | 25,734 |
| Total | | 489,806 | | | | 240,109 |
| Hard clams: | | | | | | |
| ½-pound (48 cans) | 577 | 3,308 | 22,301 | $83,678 | | |
| No. 1 (48 cans) | 1,676 | 11,984 | 3,514 | 18,670 | 221,146 | 766,680 |
| 1-pound (12 cans) | | | | | 313,199 | 528,815 |
| 1-pound (24 cans) | | | | | 30,702 | 57,081 |
| 1-pound (48 cans) | 5,765 | 41,229 | 18 | 175 | | |
| No. 2 (24 cans) | 6,040 | 34,901 | 1,701 | 10,152 | | |
| No. 3 (12 cans) | | | | | 31,781 | 42,894 |
| No. 10 (6 cans) | 8,988 | 45,335 | 5,879 | 53,030 | 8,806 | 38,568 |
| Other sizes (standard cases) | 932 | 7,255 | 2,050 | 13,130 | 11,329 | 35,802 |
| Total | | 144,012 | | 178,835 | | 1,469,840 |
| Razor clams: | | | | | | |
| ½-pound (48 cans) | | | 34,691 | 241,611 | | |
| No. 1 (48 cans) | 1,458 | 12,495 | 14,020 | 122,345 | | |
| 1-pound (48 cans) | 15 | 150 | 63 | 630 | | |
| No. 2 (24 cans) | 47 | 376 | 385 | 2,695 | | |
| Total | | 13,021 | | 367,281 | | |
| Grand total | | 646,839 | | 546,116 | | 1,709,949 |

NOTE.—"Standard cases" represents the various-sized cases converted to the equivalent of 48 No. 1 cans. Soft-clam products were canned at 18 plants in Maine, 2 in Massachusetts, 1 in New Jersey, and 1 in Illinois; hard-clam products, at 1 plant in Massachusetts, 1 in Rhode Island, 1 in New York, 4 in New Jersey, 1 in Pennsylvania, 3 in Maryland, 1 in Florida, 4 in Washington, and 3 in Alaska; razor-clam products, at 5 plants in Washington, 3 in Oregon, and 5 in Alaska; and coquina-clam products, at 1 plant in Florida.

*Canned fishery products and byproducts of the United States and Alaska, 1937*—Con.

PACK OF CANNED CLAMS AND CLAM PRODUCTS: ACTUAL CASES—Continued

| Product and size | Juice, broth, and cocktail | | Total | |
|---|---|---|---|---|
| | *Cases* | *Value* | *Cases* | *Value* |
| Soft clams: | | | | |
| No. 1 (48 cans) | | | 119, 154 | $424, 491 |
| 1-pound (24 cans) | | | 11, 945 | 29, 887 |
| 1-pound (48 cans) | | | 11, 849 | 75, 203 |
| No. 2 (24 cans) | 7, 828 | $8, 852 | 22, 988 | 63, 421 |
| No. 2½ (24 cans) | | | 26, 812 | 109, 490 |
| No. 3 (24 cans) | | | 1, 384 | 4, 735 |
| No. 10 (6 cans) | 541 | 879 | 541 | 879 |
| Other sizes (standard cases) | 5, 598 | 16, 038 | 15, 540 | 47, 578 |
| Total | | 25, 769 | | 755, 684 |
| Hard clams: | | | | |
| 6-ounce (48 cans) | 3, 427 | 12, 732 | 3, 427 | 12, 732 |
| ½-pound (48 cans) | | | 22, 878 | 86, 986 |
| ½-pound (96 cans) | 171 | 1, 460 | 171 | 1, 460 |
| No. 1 (48 cans) | 1, 920 | 7, 051 | 228, 256 | 804, 385 |
| 1-pound (12 cans) | | | 313, 199 | 528, 815 |
| 1-pound (24 cans) | | | 30, 702 | 57, 081 |
| 1-pound (48 cans) | 142 | 818 | 5, 925 | 42, 222 |
| No. 2 (24 cans) | 3, 349 | 10, 188 | 11, 090 | 55, 241 |
| No. 3 (12 cans) | | | 31, 781 | 42, 894 |
| No. 10 (6 cans) | 6, 226 | 25, 503 | 29, 899 | 162, 436 |
| Other sizes (standard cases) | 5, 872 | 26, 617 | 20, 183 | 82, 804 |
| Total | | 84, 369 | | 1, 877, 056 |
| Razor clams: | | | | |
| ½-pound (48 cans) | | | 34, 691 | 241, 611 |
| No. 1 (48 cans) | 91 | 364 | 15, 569 | 135, 204 |
| 1-pound (48 cans) | | | 78 | 780 |
| No. 2 (24 cans) | 10 | 40 | 442 | 3, 111 |
| Total | | 404 | | 380, 706 |
| Grand total | | 110, 542 | | 3, 013, 446 |

NOTE.—"Standard cases" represents the various-sized cases converted to the equivalent of 48 No. 1 cans Soft-clam products were canned at 18 plants in Maine, 2 in Massachusetts, 1 in New Jersey, and 1 in Illinois; hard-clam products, at 1 plant in Massachusetts, 1 in Rhode Island, 1 in New York, 4 in New Jersey, 1 in Pennsylvania, 3 in Maryland, 1 in Florida, 4 in Washington, and 3 in Alaska; razor-clam products, at 5 plants in Washington, 3 in Oregon, and 5 in Alaska; and coquina-clam products, at 1 plant in Florida.

PACK OF CANNED SHRIMP: STANDARD CASES

| State | Dry pack (in tins) | | Wet pack (in tins) | | Wet pack (in glass) | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| Georgia | 17, 630 | $97, 747 | 86, 021 | $467, 102 | 14, 849 | $139, 640 | 118, 500 | $704, 489 |
| Florida | 6, 904 | 35, 534 | 27, 838 | 149, 945 | 12, 697 | 117, 305 | 47, 439 | 302, 784 |
| Alabama | (19) | (19) | 42, 471 | 226, 826 | | | 42, 471 | 226, 826 |
| Mississippi | 65, 109 | 357, 458 | 247, 042 | 1, 306, 493 | | | 312, 151 | 1, 663, 951 |
| Louisiana | 196, 089 | 1, 107, 698 | 481, 336 | 2, 522, 483 | (20) | (20) | 677, 425 | 3, 630, 181 |
| Texas | [19] 10, 751 | [19] 62, 665 | 49, 224 | 281, 485 | [20] 28, 394 | [20] 258, 070 | 88, 369 | 602, 220 |
| Alaska | | | 51 | 296 | | | 51 | 296 |
| Total | 296, 483 | 1, 661, 102 | 933, 983 | 4, 954, 630 | 55, 940 | 515, 015 | 1, 286, 406 | 7, 130, 747 |

PACK OF CANNED SHRIMP: ACTUAL CASES

| Size | Cases | Value | Size | Cases | Value |
|---|---|---|---|---|---|
| In tins, dry: | | | In glass, wet: | | |
| 4-ounce (48 cans) | 8, 105 | $34, 787 | 2½-ounce (48 cans) | 26, 537 | $124, 114 |
| 5-ounce (48 cans) | 263, 225 | 1, 464, 237 | 4-ounce (24 cans) | 8, 876 | 31, 697 |
| 8¼-ounce (24 cans) | 29, 315 | 147, 516 | 5¾-ounce (24 cans) | 39, 115 | 173, 384 |
| Other sizes (standard cases) | 2, 589 | 14, 562 | 6-ounce (24 cans) | 41, 709 | 185, 820 |
| In tins, wet: | | | | | |
| 5¾-ounce (48 cans) | 930, 937 | 4, 934, 779 | Total | | 7, 130, 747 |
| 9¾-ounce (24 cans) | 3, 352 | 17, 670 | | | |
| Other sizes (standard cases) | 205 | 2, 181 | | | |

[19] The dry pack of shrimp for Alabama has been included with Texas.
[20] The pack of shrimp in glass for Louisiana has been included with Texas.

NOTE.—"Standard cases" represents the various-sized cases converted to the equivalent of 48 5-ounce cans to the case in the dry pack and 48 5¾-ounce cans to the case in the wet pack. Shrimp were canned at 6 plants in Georgia, 6 in Florida, 3 in Alabama, 15 in Mississippi, 27 in Louisiana, 3 in Texas, and 1 in Alaska.

*Canned fishery products and byproducts of the United States and Alaska, 1937*—Con.

PACK OF MISCELLANEOUS CANNED FISHERY PRODUCTS: STANDARD CASES

| Product | Atlantic and Gulf Coasts [21] | | Pacific Coast (including Alaska) | | Total | |
|---|---|---|---|---|---|---|
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| Shad | | | 9,219 | $30,554 | 9,219 | $30,554 |
| Shad roe | | | 1,891 | 49,868 | 1,891 | 49,868 |
| Cat and dog food | 187,732 | $292,221 | 189,309 | 548,086 | 377,041 | 840,307 |
| Fish flakes [22] | 39,880 | 353,071 | | | 39,880 | 353,071 |
| Fish cakes, balls, etc | 109,285 | 754,770 | | | 109,285 | 754,770 |
| Fish paste | [23] 3,696 | [23] 137,624 | (23) | (23) | 3,696 | 137,624 |
| Sturgeon caviar | 3,053 | 435,370 | | | 3,053 | 435,370 |
| Whitefish roe and caviar | 1,332 | 49,395 | | | 1,332 | 49,395 |
| Salmon roe and caviar (for food) | 1,534 | 36,001 | | | 1,534 | 36,001 |
| Salmon eggs (for bait) | | | 5,349 | 85,398 | 5,349 | 85,398 |
| Miscellaneous fish and roe [24] | 10,319 | 92,684 | 875 | 8,902 | 11,194 | 101,586 |
| Crabs | (25) | (25) | [25] 13,697 | [25] 269,699 | 13,697 | 269,699 |
| Oyster soup | 32,961 | 182,518 | | | 32,961 | 182,518 |
| Terrapin products | 136 | 8,715 | | | 136 | 8,715 |
| Turtle products | 5,824 | 73,737 | | | 5,824 | 73,737 |
| Miscellaneous shellfish, etc.[26] | [27] 6,581 | [27] 51,130 | (27) | (27) | 6,581 | 51,130 |
| Total | 402,333 | 2,467,236 | 220,340 | 992,507 | 622,673 | 3,459,743 |

[21] Includes the production of whitefish caviar by 1 firm in Wisconsin.

[22] Tuna flakes are not included in this table, but are included in the table for canned tuna and tunalike fishes.

[23] The production of 1 firm in Washington is included with the production for the Atlantic and Gulf coasts.

[24] Includes salted cod, pickled eels, finnan haddie, fish bouillon, fish chowder, haddock chowder, fish prepared for poisoning rats, kippered salmon, kippered sturgeon, groundfish roe, and tuna roe.

[25] The production of hard crabs by 1 firm in Virginia and of soft crabs by 1 firm in Louisiana is included with the production for the Pacific coast.

[26] Includes clam cakes, crab and shrimp gumbo, fresh-water crayfish, frog and frog's legs, pickled mussels, shrimp soup, and squid.

[27] The production of squid by 1 firm in California is included with the production for the Atlantic and Gulf coasts.

NOTE.—"Standard cases" represents the various-sized cases converted to the equivalent of 48 1-pound cans to the case. Shad were canned at 9 plants; shad roe, at 8 plants; cat and dog food, at 9 plants; fish flakes, at 4 plants; fish cakes, balls, etc., at 8 plants; fish paste, at 4 plants; sturgeon caviar, at 4 plants; whitefish roe and caviar, at 5 plants; salmon roe and caviar (for food), at 4 plants; salmon eggs (for bait), at 10 plants; miscellaneous fish and roe, at 15 plants; crabs, at 18 plants; oyster soup, at 3 plants; terrapin products, at 4 plants; turtle products, at 3 plants; and miscellaneous shellfish, etc., at 9 plants.

PRODUCTION OF OYSTER AND MARINE CLAM-SHELL PRODUCTS [28]

| State | Crushed shell for poultry feed | | Shell lime | | Total | |
|---|---|---|---|---|---|---|
| | *Tons* | *Value* | *Tons* | *Value* | *Tons* | *Value* |
| Rhode Island, Connecticut, New York, and Delaware | 2,133 | $20,801 | 481 | $2,045 | 2,614 | $22,846 |
| New Jersey | 4,441 | 35,174 | 1,763 | 8,359 | 6,204 | 43,533 |
| Pennsylvania | 4,294 | 38,969 | 1,109 | 4,533 | 5,403 | 43,502 |
| Maryland | 37,621 | 171,855 | 29,180 | 52,190 | 66,801 | 224,045 |
| Virginia | 19,377 | 113,395 | [29] 31,441 | [29] 201,201 | 50,818 | 314,596 |
| North Carolina, South Carolina, and Florida | 47,462 | 239,642 | 5,816 | 19,710 | 53,278 | 259,352 |
| Alabama, Louisiana, and Texas | 138,433 | 427,481 | 11,892 | 43,297 | 150,325 | 470,778 |
| Mississippi | 17,045 | 62,397 | 2,945 | 4,274 | 19,990 | 66,671 |
| Washington and Oregon | 8,115 | 73,555 | 3,263 | 20,059 | 11,378 | 93,614 |
| California | 14,402 | 67,533 | 1,505 | 6,377 | 15,907 | 73,910 |
| Total | 293,323 | 1,250,802 | 89,395 | 362,045 | 382,718 | 1,612,847 |

[28] The production in Washington includes both clam- and oyster-shell products.

[29] Of this amount 13,098 tons, valued at $89,119, were reported as "burned" lime.

NOTE.—The above crushed-shell products were prepared at 2 plants in Rhode Island, 1 in Connecticut, 1 in New York, 6 in New Jersey, 4 in Pennsylvania, 1 in Delaware, 4 in Maryland, 9 in Virginia, 3 in North Carolina, 1 in South Carolina, 2 in Florida, 1 in Alabama, 3 in Mississippi, 1 in Louisiana, 2 in Texas, 7 in Washington, 1 in Oregon, and 5 in California.

*Canned fishery products and byproducts of the United States and Alaska, 1937*—Con.

### PRODUCTION OF FRESH-WATER MUSSEL-SHELL PRODUCTS

| Item | Iowa, Missouri, and Wisconsin | | New York | | Total | |
|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Pearl buttons gross | 12,960,342 | $3,751,879 | 4,185,307 | $981,039 | 17,145,649 | $4,732,918 |
| Crushed shell for poultry feed tons | 4,450 | 27,427 | | | 4,450 | 27,427 |
| Lime do | [30] 1,026 | [30] 1,448 | (30) | (30) | 1,026 | 1,448 |
| Other products [31] | | 29,412 | | | | 29,412 |
| Total | | 3,810,166 | | 981,039 | | 4,791,205 |

[30] A small amount of lime produced in New York has been combined with a production in Iowa.
[31] Includes mussel-shell chips and novelties produced in Iowa.

NOTE.—Mussel shells purchased during the year amounted to 53,988,000 pounds, valued at $829,524. Shells were taken in 17 States in the Mississippi River Valley and Great Lakes region. The producing States in order of their importance, were Arkansas, which contributed 28 percent of the total quantity; Tennessee, 21 percent; Illinois, 13 percent; Kentucky, 12 percent; Indiana, 10 percent; Alabama, Iowa, Michigan, Mississippi, Texas, and Wisconsin, each 2 percent; Minnesota, Missouri, and Oklahoma, each 1 percent, and Louisiana, Ohio, and South Dakota each less than 1 percent.

### PRODUCTION OF MARINE PEARL-SHELL PRODUCTS [32]

| Item | Massachusetts, Rhode Island, and Connecticut | | New York | | New Jersey | |
|---|---|---|---|---|---|---|
| | *Gross* | *Value* | *Gross* | *Value* | *Gross* | *Value* |
| Pearl buttons | 1,756,796 | $1,118,105 | 1,138,334 | $813,556 | 1,646,622 | $1,254,165 |
| Novelties [33] | | 181,623 | | 113,500 | | 91,922 |
| Total | | 1,299,728 | | 927,056 | | 1,346,087 |

| Item | Maine, Pennsylvania, Maryland, and Florida | | Oregon and California | | Total | |
|---|---|---|---|---|---|---|
| | *Gross* | *Value* | *Gross* | *Value* | *Gross* | *Value* |
| Pearl buttons | 2,190,299 | $1,131,135 | | | 6,732,051 | $4,316,961 |
| Novelties [33] | | 275,000 | | $100,889 | | 762,934 |
| Total | | 1,406,135 | | 100,889 | | 5,079,895 |

[32] Produced principally from imported shells.
[33] Includes knife handles, handles for manicure sets, dolls, lamps, mounted fish decoys, etc.

NOTE.—Marine pearl-shell products were manufactured at 1 plant in Maine, 2 in Massachusetts, 1 in Rhode Island, 7 in Connecticut, 9 in New York, 19 in New Jersey, 1 in Pennsylvania, 1 in Maryland, 16 in Florida, 1 in Oregon, and 2 in California.

### FISH UTILIZED AND PRODUCTS OF THE MENHADEN INDUSTRY

| State | Menhaden utilized | Products | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Dry scrap and meal | | Acidulated scrap | | Oil | | Total |
| | *Number* | *Tons* | *Value* | *Tons* | *Value* | *Gallons* | *Value* | *Value* |
| New York, New Jersey, Delaware, and Georgia | 224,392,000 | 7,497 | $345,463 | [34] 12,236 | [34] $251,339 | 1,548,028 | $583,611 | $1,180,413 |
| Virginia | 199,556,000 | 14,252 | 615,213 | (34) | (34) | 1,361,181 | 522,476 | 1,137,689 |
| North Carolina | 168,534,000 | 6,039 | 256,312 | 10,731 | 208,371 | 839,598 | 294,443 | 759,126 |
| Florida | 197,371,000 | 8,013 | 364,231 | 8,633 | 158,394 | 146,806 | 55,803 | 578,428 |
| Total | [35] 789,853,000 | [36] 35,801 | [36] 1,581,219 | 31,600 | 618,104 | 3,895,613 | 1,456,333 | 3,655,656 |

[34] The production of 1 firm in Virginia is included with New York, New Jersey, Delaware, and Georgia.
[35] 473,911,800 pounds.
[36] Of this production 22,763 tons, valued at $985,075, were reported as dry scrap, and 13,038 tons, valued at $596,144, as fish meal.

NOTE.—The menhaden factories were located as follows: 1 in New York, 2 in New Jersey, 2 in Delaware, 11 in Virginia, 10 in North Carolina, 1 in Georgia, and 5 in Florida.

*Canned fishery products and byproducts of the United States and Alaska, 1937*—Con.

PRODUCTION OF MISCELLANEOUS BYPRODUCTS

| Product | Atlantic and Gulf Coasts [37] | | Pacific Coast (including Alaska) | | Total | |
|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Dried scrap: | | | | | | |
| Alewife..........tons.. | 750 | $31,327 | | | 750 | $31,327 |
| Herring..........do.... | 1,452 | 40,622 | | | 1,452 | 40,622 |
| Blue crab..........do.... | 1,303 | 26,629 | | | 1,303 | 26,629 |
| King crab..........do.... | 535 | 19,371 | | | 535 | 19,371 |
| Miscellaneous [38]..........do.... | 1,252 | 31,294 | | | 1,252 | 31,294 |
| Meal: | | | | | | |
| Groundfish, "white fish" tons.. | 14,178 | 396,995 | | | 14,178 | 396,995 |
| Herring (Alaska)..........do.... | | | 18,816 | $629,269 | 18,816 | 629,269 |
| Herring (Maine)..........do.... | 1,644 | 51,113 | | | 1,644 | 51,113 |
| Mackerel..........do.... | | | 2,194 | 77,827 | 2,194 | 77,827 |
| Pilchard..........do.... | | | 89,422 | 3,325,282 | 89,422 | 3,325,282 |
| Salmon..........do.... | | | 1,608 | 49,356 | 1,608 | 49,356 |
| Tuna..........do.... | | | 10,872 | 378,531 | 10,872 | 378,531 |
| King crab..........do.... | 25 | 625 | | | 25 | 625 |
| Shrimp..........do.... | 1,334 | 30,573 | 118 | 3,220 | 1,452 | 33,793 |
| Whale (meat)..........do.... | | | 770 | 25,410 | 770 | 25,410 |
| Whale (bone)..........do.... | | | 435 | 7,395 | 435 | 7,395 |
| Miscellaneous [39]..........do.... | 3,681 | 169,457 | 1,867 | 67,896 | 5,548 | 237,353 |
| Oil: | | | | | | |
| Alewife..........gallons.. | 12,450 | 3,073 | | | 12,450 | 3,073 |
| Cod..........do.... | 7,429 | 2,889 | | | 7,429 | 2,889 |
| Cod-liver..........do.... | 275,802 | 167,572 | | | 275,802 | 167,572 |
| Fur-seal..........do.... | | | 29,341 | 5,397 | 29,341 | 5,397 |
| Herring (Alaska)..........do.... | | | 5,569,192 | 2,105,341 | 5,569,192 | 2,105,341 |
| Herring (Maine)..........do.... | 53,853 | 9,207 | | | 53,853 | 9,207 |
| Mackerel..........do.... | | | 80,811 | 30,812 | 80,811 | 30,812 |
| Pilchard..........do.... | | | 15,993,216 | 6,203,616 | 15,993,216 | 6,203,616 |
| Salmon [40]..........do.... | | | 167,265 | 94,122 | 167,265 | 94,122 |
| Shark..........do.... | | | 9,880 | 4,096 | 9,880 | 4,096 |
| Tuna..........do.... | | | 141,963 | 30,702 | 141,963 | 30,702 |
| Whale: | | | | | | |
| Sperm..........do.... | 5,837 | 1,500 | 168,250 | 45,832 | 174,087 | 47,332 |
| Other..........do.... | 8,270,752 | 3,693,169 | 781,450 | 429,500 | 9,052,202 | 4,122,669 |
| Liver (other than cod) [41] gallons.. | 34,777 | 821,797 | 37,342 | 1,214,728 | 72,119 | 2,036,525 |
| Miscellaneous [42]..........do.... | 39,946 | 15,241 | 59,500 | 20,825 | 99,446 | 36,066 |
| Liquid glue..........do.... | [43] 441,912 | [43] 908,121 | (43) | (43) | 441,912 | 908,121 |
| Shark fins..........pounds.. | 30,263 | 13,388 | | | 30,263 | 13,388 |
| Shark skins..........do.... | 138,058 | 12,306 | | | 138,058 | 12,306 |
| Miscellaneous byproducts [44]..... | | 192,953 | | 276,063 | | 469,016 |
| Total.......... | | 6,639,222 | | 15,025,220 | | 21,664,442 |

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[37] Includes the production of burbot-liver oil in Minnesota and Wisconsin.

[38] Includes shark and miscellaneous dry scrap, as well as the production of miscellaneous acid scrap by 1 firm in Virginia.

[39] Includes salmon-egg, shark, starfish, clam, and miscellaneous meals and cod-liver pressings.

[40] Includes a considerable quantity of salmon oil especially prepared for human consumption.

[41] Includes burbot-, halibut-, sablefish-, shark-, swordfish-, and tuna-liver oils.

[42] Includes blackfish, rosefish, and miscellaneous fish oils.

[43] A quantity of liquid glue produced by 1 firm in California is included with the production of liquid glue on the Atlantic and Gulf coasts.

[44] Includes herring and miscellaneous green scrap, isinglass, kelp products, pearl essence, and miscellaneous novelties.

NOTE.—The whale products shown for the Atlantic and Gulf coasts were produced on factory ships operating in the Southern Hemisphere.

## FROZEN-FISH TRADE [3]

### FISH, FROZEN

During 1937 the output of freezing plants which reported their activities to the Government amounted to 168,223,653 pounds of fishery products. At the time these products were held in cold-storage plants they were estimated to be valued at about $13,500,000. Compared with the output in 1936, this is a decrease of 6 percent in volume. Five species or groups of species accounted for 60 percent of the total amount frozen. In the order of their importance, they were: Cod, haddock, hake, and pollock (including cod, haddock, and pollock fillets), which accounted for 22 percent of the total; whiting, 11 percent; salmon, 10 percent; halibut, 9 percent; and rosefish, 8 percent. Other products frozen in considerable quantity during the year were mackerel, sablefish, and shellfish.

*Production of frozen fishery products, 1937*

BY SPECIES AND MONTHS

| Species | Month ended the 15th of— | | | | | | |
|---|---|---|---|---|---|---|---|
| | January | February | March | April | May | June | July |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Bluefish (all trade sizes) | 129, 710 | 10, 691 | 25, 843 | 8, 367 | 38, 227 | 5, 829 | 2, 387 |
| Butterfish (all trade sizes) | 4, 591 | 2, 888 | 9, 645 | 17, 903 | 19, 917 | 130, 650 | 127, 817 |
| Catfish | 41, 261 | 12, 406 | 15, 894 | 53, 284 | 95, 122 | 47, 791 | 38, 510 |
| Cisco (Lake Erie) | 17, 229 | 10, 657 | --------- | 3, 237 | 2, 966 | 831 | 18, 751 |
| Cisco (lake herring) including bluefin, blackfin, and chub | 424, 485 | 44, 682 | 30, 818 | 48, 242 | 24, 149 | 20, 598 | 90, 424 |
| Cisco (tullibees, Canadian lakes) | 15, 610 | 886 | 8, 175 | 8, 529 | --------- | --------- | 3, 767 |
| Cod, haddock, hake, and pollock (except fillets of cod, haddock, and pollock) | 242, 404 | 131, 176 | 153, 559 | 57, 963 | 229, 059 | 302, 382 | 184, 142 |
| Cod fillets | 423, 122 | 90, 848 | 125, 495 | 210, 355 | 490, 351 | 781, 764 | 1, 357, 228 |
| Croaker | 8, 308 | 7, 106 | 20, 310 | 17, 059 | 128, 994 | 706, 774 | 732, 860 |
| Flounders | 123, 227 | 30, 631 | 9, 496 | 8, 919 | 156, 332 | 350, 295 | 102, 748 |
| Haddock fillets | 1, 415, 549 | 964, 187 | 1, 399, 388 | 2, 177, 233 | 1, 286, 613 | 1, 825, 201 | 1, 969, 445 |
| Halibut (all trade sizes) | --------- | --------- | --------- | 1, 670, 981 | 2, 037, 228 | 3, 461, 509 | 2, 933, 571 |
| Herring, sea (including alewives and bluebacks) | 74, 820 | 21, 375 | 114, 770 | 225, 967 | 240, 633 | 165, 350 | 71, 746 |
| Lake trout | 37, 582 | 12, 508 | 13, 061 | 17, 204 | 35, 002 | 58, 808 | 73, 594 |
| Mackerel (except Spanish) | 82, 056 | 48, 023 | 18, 602 | 82, 567 | 173, 358 | 1, 312, 787 | 472, 976 |
| Perch, yellow | 3, 912 | 21, 254 | 2, 169 | 4, 050 | 4, 618 | 3, 322 | 15, 699 |
| Pike, blue and sauger | 69, 759 | 1, 746 | 654 | 33, 606 | 230, 522 | 234, 547 | 37, 909 |
| Pike, yellow or wall-eyed | 17, 471 | 8, 296 | 32, 966 | 100, 879 | 13, 653 | 66, 065 | 2, 184 |
| Pike (including pickerel, jacks, and yellow jack) | 58, 354 | 466 | 2, 873 | 11, 910 | 19, 457 | 5, 959 | 5, 579 |
| Pollock fillets | 1, 258, 586 | 246, 798 | 86, 667 | 177, 052 | 341, 024 | 869, 505 | 713, 480 |
| Rosefish | 1, 058, 047 | 328, 155 | 61, 255 | 60, 364 | 273, 190 | 2, 063, 708 | 1, 562, 081 |
| Sablefish (black cod) | 40, 336 | 1, 792 | 15, 840 | 7, 065 | 15, 493 | 30, 377 | 93, 613 |
| Salmon, chinook or king | 30, 911 | 21, 918 | 28, 937 | 7, 841 | 43, 356 | 524, 138 | 650, 944 |
| Salmon, silver or coho | 75, 128 | 30, 094 | 48, 505 | 51, 695 | 8, 959 | 159, 526 | 258, 993 |
| Salmon, fall and pink | 21, 536 | 26, 419 | 46, 746 | 8, 232 | 3, 324 | 2, 500 | 4, 805 |
| Salmon, steelhead trout | 52, 181 | 2, 030 | 22, 164 | 9, 707 | 17, 331 | 8, 438 | 49, 363 |
| Scup (porgies) | 3, 823 | 3, 023 | 50 | 1, 471 | 13, 088 | 99, 062 | 147, 269 |
| Shad and shad roe | 33, 826 | 5, 979 | 1, 277 | 36, 802 | 201, 954 | 175, 860 | 19, 582 |
| Shellfish | 352, 823 | 436, 509 | 278, 442 | 191, 068 | 1, 352, 625 | 1, 448, 401 | 1, 693, 962 |
| Smelts, eulachon, etc | 305, 624 | 181, 843 | 210, 916 | 52, 056 | 148, 601 | 9, 557 | 10, 596 |
| Squid | 61, 530 | 11, 970 | 2, 529 | 547 | 622, 949 | 2, 687, 378 | 187, 064 |
| Sturgeon and spoonbill cat | 2, 218 | 2, 283 | 17, 547 | 7, 217 | 23, 232 | 20, 279 | 16, 319 |
| Suckers | 3, 183 | --------- | --------- | 4, 479 | 20, 306 | 30, 801 | 12, 296 |
| Swordfish | 12, 536 | 29, 045 | 18, 099 | 335, 820 | 97, 079 | 32, 065 | 65, 409 |
| Weakfish (including southern "sea trout") | 11, 896 | 147 | 1, 103 | 1, 605 | 11, 118 | 144, 127 | 215, 861 |
| Whitefish | 119, 493 | 171, 590 | 142, 137 | 224, 577 | 51, 534 | 17, 604 | 127, 377 |
| Whiting | 74, 905 | 65, 354 | 68, 439 | 34, 137 | 259, 042 | 4, 113, 707 | 5, 253, 170 |
| Miscellaneous fish | 1, 373, 267 | 967, 907 | 1, 159, 787 | 1, 547, 260 | 1, 614, 064 | 2, 258, 681 | 1, 645, 702 |
| Total | 8, 081, 299 | 3, 952, 682 | 4, 194, 158 | 7, 517, 250 | 10, 344, 470 | 24, 176, 176 | 20, 969, 223 |

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[3] The statistics in this section have been furnished by the Bureau of Agricultural Economics, Department of Agriculture.

*Production of frozen fishery products, 1937*—Continued

BY SPECIES AND MONTHS

| Species | Month ended the 15th of— | | | | | |
|---|---|---|---|---|---|---|
| | August | September | October | November | December | Total |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Bluefish (all trade sizes) | 40, 478 | 95, 975 | 139, 518 | 69, 746 | 192, 890 | 759, 661 |
| Butterfish (all trade sizes) | 271, 346 | 74, 247 | 142, 812 | 38, 572 | 68, 692 | 909, 080 |
| Catfish | 22, 598 | 27, 796 | 18, 416 | 41, 528 | 66, 493 | 481, 099 |
| Cisco (Lake Erie) | 24, 556 | 6, 724 | 7, 211 | 41, 288 | 123, 386 | 256, 836 |
| Cisco (lake herring) including bluefin, blackfin, and chub | 186, 072 | 136, 194 | 152, 579 | 886, 059 | 905, 338 | 2, 949, 640 |
| Cisco (tullibees, Canadian lakes) | 4, 219 | 907 | 673 | 4, 982 | ---------- | 47, 748 |
| Cod, haddock, hake, and pollock (except fillets of cod, haddock, and pollock) | 155, 603 | 291, 017 | 265, 369 | 219, 780 | 138, 110 | 2, 370, 564 |
| Cod fillets | 849, 950 | 489, 905 | 545, 605 | 537, 809 | 519, 905 | 6, 422, 337 |
| Croaker | 365, 706 | 30, 563 | 2, 910 | 6, 051 | 2, 800 | 2, 029, 441 |
| Flounders | 50, 763 | 28, 532 | 98, 388 | 172, 428 | 109, 591 | 1, 241, 350 |
| Haddock fillets | 2, 201, 569 | 2, 183, 846 | 2, 651, 580 | 701, 844 | 799, 541 | 19, 575, 996 |
| Halibut (all trade sizes) | 2, 642, 500 | 937, 834 | 857, 596 | 1, 183, 568 | ---------- | 15, 724, 787 |
| Herring, sea (including alewives and bluebacks) | 150, 768 | 72, 793 | 1, 209, 608 | 1, 003, 345 | 342, 897 | 3, 694, 072 |
| Lake trout | 64, 909 | 46, 707 | 125, 310 | 145, 027 | 102, 530 | 732, 242 |
| Mackerel (except Spanish) | 866, 361 | 279, 026 | 491, 619 | 541, 806 | 1, 117, 264 | 5, 486, 445 |
| Perch, yellow | 26, 868 | 20, 380 | 24, 327 | 98, 978 | 21, 394 | 246, 971 |
| Pike, blue and sauger | 40, 156 | 3, 529 | 39, 590 | 85, 259 | 46, 893 | 824, 170 |
| Pike, yellow or wall-eyed | 16, 165 | 11, 994 | 27, 510 | 10, 621 | 19, 408 | 327, 212 |
| Pike (including pickerel, jacks, and yellow jack) | 7, 397 | 4, 058 | 14, 638 | 48, 684 | 21, 208 | 200, 583 |
| Pollock fillets | 497, 535 | 248, 965 | 299, 955 | 1, 015, 891 | 2, 905, 778 | 8, 661, 236 |
| Rosefish | 1, 734, 696 | 1, 315, 507 | 1, 039, 604 | 1, 979, 754 | 1, 540, 725 | 13, 017, 086 |
| Sablefish (black cod) | 501, 321 | 980, 548 | 989, 691 | 1, 135, 517 | 196, 526 | 4, 008, 119 |
| Salmon, chinook or king | 724, 524 | 996, 946 | 1, 204, 093 | 421, 832 | 78, 096 | 4, 733, 536 |
| Salmon, silver or coho | 959, 621 | 2, 302, 266 | 1, 777, 241 | 878, 363 | 20, 551 | 6, 570, 942 |
| Salmon, fall and pink | 280, 757 | 201, 296 | 534, 274 | 3, 621, 504 | 404, 727 | 5, 156, 120 |
| Salmon, steelhead trout | 244, 935 | 217, 555 | 66, 507 | 32, 312 | 40, 649 | 763, 172 |
| Scup (porgies) | 35, 031 | 83, 783 | 11, 205 | 2, 051 | 1, 269 | 401, 125 |
| Shad and shad roe | 2, 707 | 1, 896 | 302 | 19, 540 | 55, 813 | 555, 538 |
| Shellfish | 901, 253 | 1, 374, 779 | 1, 230, 023 | 1, 950, 765 | 993, 993 | 12, 204, 643 |
| Smelts, eulachon, etc | 18, 472 | 31, 155 | 49, 242 | 75, 637 | 149, 068 | 1, 242, 767 |
| Squid | 77, 449 | 116, 586 | 7, 841 | 8, 217 | 13, 763 | 3, 797, 823 |
| Sturgeon and spoonbill cat | 11, 425 | 10, 073 | 18, 863 | 16, 551 | 43, 815 | 189, 822 |
| Suckers | 8, 669 | 310 | 1, 168 | 10, 379 | 131, 845 | 223, 436 |
| Swordfish | 80, 776 | 115, 065 | 83, 831 | 154, 519 | 826, 259 | 1, 850, 503 |
| Weakfish (including southern "sea trout") | 163, 641 | 546, 968 | 626, 203 | 157, 328 | 53, 209 | 1, 933, 206 |
| Whitefish | 47, 495 | 24, 890 | 64, 246 | 47, 536 | 76, 696 | 1, 115, 175 |
| Whiting | 915, 505 | 740, 206 | 2, 627, 975 | 1, 632, 245 | 1, 934, 560 | 17, 719, 245 |
| Miscellaneous fish | 1, 653, 613 | 1, 666, 927 | 1, 731, 265 | 1, 931, 256 | 2, 250, 196 | 19, 799, 925 |
| Total | 16, 847, 409 | 15, 717, 748 | 19, 178, 788 | 20, 928, 572 | 16, 315, 878 | 168, 223, 653 |

BY GEOGRAPHICAL SECTIONS AND SPECIES[1]

[Expressed in thousands of pounds; that is, 000 omitted]

| Species | New England | Middle Atlantic | South Atlantic | North Central, East | North Central, West | South Central | Pacific | Total |
|---|---|---|---|---|---|---|---|---|
| Bluefish (all trade sizes) | 31 | 683 | 7 | 37 | -------- | 3 | -------- | 761 |
| Butterfish (all trade sizes) | 303 | 586 | 19 | -------- | 1 | 1 | -------- | 910 |
| Catfish | 158 | 2 | 49 | 74 | 160 | 38 | -------- | 481 |
| Cisco (Lake Erie) | 3 | 251 | 3 | -------- | -------- | -------- | -------- | 257 |
| Cisco (lake herring) including, bluefin, blackfin, and chub | 11 | 523 | -------- | 1, 661 | 756 | -------- | -------- | 2, 951 |
| Cisco (tullibees, Canadian lakes) | 8 | 31 | -------- | 8 | -------- | -------- | -------- | 47 |
| Cod, haddock, hake, and pollock (except fillets of cod, haddock, and pollock) | 987 | 146 | 2 | 123 | 6 | 781 | 326 | 2, 371 |
| Cod fillets | 6, 221 | 8 | -------- | 106 | 50 | -------- | 37 | 6, 422 |

[1] New England includes the 6 States of that section; Middle Atlantic—New York, New Jersey, and Pennsylvania; South Atlantic—Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida; North Central, East—Ohio, Indiana, Illinois, Michigan, and Wisconsin; North Central, West—Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas; South Central—Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Oklahoma, and Arkansas; and Pacific—Washington, Oregon, California, and Alaska.

*Production of frozen fishery products, 1937*—Continued

BY GEOGRAPHICAL SECTIONS AND SPECIES—Continued

[Expressed in thousands of pounds; that is, 000 omitted]

| Species | New England | Middle Atlantic | South Atlantic | North Central, East | North Central, West | South Central | Pacific | Total |
|---|---|---|---|---|---|---|---|---|
| Croaker |  | 368 | 1,601 | 56 |  | 4 |  | 2,029 |
| Flounders | 333 | 685 | 2 | 1 |  | 2 | 218 | 1,241 |
| Haddock fillets | 19,263 | 55 | 22 | 205 | 5 |  | 26 | 19,576 |
| Halibut (all trade sizes) | 225 | 307 | 3 | 188 | 28 | 12 | 14,960 | 15,723 |
| Herring, sea (including alewives and bluebacks) | 2,157 | 363 | 24 | 464 | 1 | 6 | 679 | 3,694 |
| Lake trout | 20 | 237 | 15 | 359 | 82 | 11 | 9 | 733 |
| Mackerel (except Spanish) | 3,756 | 1,327 | 83 | 85 |  |  | 236 | 5,487 |
| Perch, yellow |  | 8 | 18 | 168 | 53 |  |  | 247 |
| Pike, blue and sauger |  | 410 |  | 413 | 1 |  |  | 824 |
| Pike, yellow or wall-eyed |  | 202 | 66 | 37 | 23 |  |  | 328 |
| Pike (including pickerel, jacks, and yellow jack) |  | 16 |  | 51 | 133 |  |  | 200 |
| Pollock fillets | 8,607 |  |  | 51 | 2 |  |  | 8,660 |
| Rosefish | 12,953 |  | 2 | 62 |  |  |  | 13,017 |
| Sablefish (black cod) |  | 10 |  | 6 | 41 |  | 3,951 | 4,008 |
| Salmon, chinook or king | 68 | 390 | 2 | 41 | 4 |  | 4,230 | 4,735 |
| Salmon, silver or coho | 44 | 218 |  | 14 | 8 | 1 | 6,285 | 6,570 |
| Salmon, fall and pink |  | 52 |  | 16 | 42 | 3 | 5,042 | 5,155 |
| Salmon, steelhead trout |  | 34 | 41 |  |  |  | 688 | 763 |
| Scup (porgies) | 40 | 346 | 15 |  |  |  |  | 401 |
| Shad and shad roe | 44 | 375 | 1 | 14 |  | 2 | 119 | 555 |
| Shellfish | 1,228 | 4,105 | 335 | 1,182 | 526 | 2,253 | 2,578 | 12,207 |
| Smelts, eulachon, etc | 33 | 896 | 11 | 204 |  | 2 | 96 | 1,242 |
| Squid | 1,976 | 1,799 |  | 3 |  |  | 20 | 3,798 |
| Sturgeon and spoonbill cat |  | 150 | 2 | 7 | 22 | 6 | 3 | 190 |
| Suckers |  | 2 | 140 | 72 | 10 |  |  | 224 |
| Swordfish | 552 | 866 | 6 | 4 |  |  | 422 | 1,850 |
| Weakfish (including southern "sea trout") |  | 1,620 | 312 |  |  |  |  | 1,932 |
| Whitefish | 93 | 679 | 12 | 130 | 126 | 74 | 2 | 1,116 |
| Whiting | 14,556 | 2,229 | 18 | 136 | 186 | 595 |  | 17,720 |
| Miscellaneous fish | 6,102 | 2,866 | 2,483 | 2,472 | 846 | 880 | 4,150 | 19,799 |
| Total | 79,772 | 22,845 | 5,294 | 8,450 | 3,112 | 4,674 | 44,077 | 168,224 |

BY GEOGRAPHICAL SECTIONS AND MONTHS[1]

[Expressed in thousands of pounds; that is, 000 omitted]

| Month ended the 15th of— | New England | Middle Atlantic | South Atlantic | North Central, East | North Central, West | South Central | Pacific | Total |
|---|---|---|---|---|---|---|---|---|
| January | 4,476 | 1,548 | 145 | 921 | 390 | 137 | 464 | 8,081 |
| February | 1,778 | 887 | 193 | 401 | 83 | 202 | 409 | 3,953 |
| March | 1,857 | 1,118 | 160 | 198 | 54 | 247 | 560 | 4,194 |
| April | 2,970 | 1,077 | 404 | 244 | 214 | 193 | 2,415 | 7,517 |
| May | 3,782 | 1,453 | 274 | 1,059 | 308 | 687 | 2,782 | 10,345 |
| June | 13,125 | 3,307 | 1,111 | 968 | 276 | 601 | 4,788 | 24,176 |
| July | 12,427 | 2,180 | 1,129 | 437 | 161 | 300 | 4,335 | 20,969 |
| August | 8,282 | 1,422 | 558 | 410 | 144 | 267 | 5,764 | 16,847 |
| September | 6,366 | 1,807 | 218 | 358 | 76 | 452 | 6,441 | 15,718 |
| October | 9,386 | 1,953 | 110 | 490 | 207 | 511 | 6,522 | 19,179 |
| November | 7,450 | 1,989 | 249 | 1,853 | 456 | 787 | 8,145 | 20,929 |
| December | 7,873 | 4,104 | 743 | 1,111 | 743 | 290 | 1,452 | 16,316 |
| Total | 79,772 | 22,845 | 5,294 | 8,450 | 3,112 | 4,674 | 44,077 | 168,224 |

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[1] New England includes the 6 States of that section; Middle Atlantic—New York, New Jersey, and Pennsylvania; South Atlantic—Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida; North Central, East—Ohio, Indiana, Illinois, Michigan, and Wisconsin; North Central, West—Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas; South Central—Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Oklahoma, and Arkansas; and Pacific—Washington, Oregon, California, and Alaska.

## HOLDINGS

During 1937 monthly holdings of frozen fish and shellfish averaged 63,810,000 pounds, which is an increase of 3 percent as compared with 1936. The holdings during January were the largest, amounting to 87,576,000 pounds. In only two other months did the holdings exceed 75,000,000 pounds. These were November and December. The holdings were the smallest during May, when only 40,589,000 pounds of fishery products were in storage.

## *Holdings of frozen fishery products, 1937*

### BY SPECIES AND MONTHS

| Species | Month ended the 15th of— | | | | | |
|---|---|---|---|---|---|---|
| | January | February | March | April | May | June |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Bluefish (all trade sizes) | 810, 280 | 539, 787 | 342, 293 | 195, 858 | 181, 838 | 102, 542 |
| Butterfish (all trade sizes) | 545, 192 | 382, 537 | 263, 376 | 234, 160 | 198, 201 | 293, 526 |
| Catfish | 438, 615 | 390, 176 | 313, 252 | 222, 588 | 285, 035 | 261, 795 |
| Cisco (Lake Erie) | 52, 447 | 28. 582 | 13, 598 | 1, 618 | 3, 194 | 507 |
| Cisco (lake herring) including bluefin, blackfin, and chub | 2, 295, 104 | 1, 399, 151 | 1, 032, 215 | 741, 910 | 542, 827 | 422, 737 |
| Cisco (tullibees, Canadian lakes) | 58, 722 | 42, 798 | 20, 890 | 18, 330 | 13, 973 | 6, 960 |
| Cod, haddock, hake, and pollock (except fillets of cod, haddock and pollock) | 1, 517, 789 | 1, 386, 136 | 1, 207, 778 | 1, 010, 675 | 1, 076, 465 | 1, 137, 679 |
| Cod fillets | 1, 761, 024 | 1, 542, 593 | 1, 416, 356 | 1, 433, 564 | 1, 582, 340 | 1, 933, 948 |
| Croaker | 581, 183 | 292, 758 | 202, 234 | 90, 096 | 155, 734 | 853, 457 |
| Flounders | 500, 265 | 451, 340 | 339, 875 | 196, 651 | 293, 544 | 585, 516 |
| Haddock fillets | 6, 451, 855 | 5, 305, 233 | 4, 202, 735 | 4, 761, 832 | 4, 012, 604 | 4, 178, 301 |
| Halibut (all trade sizes) | 7, 162, 435 | 3, 995, 348 | 1, 727, 970 | 2, 827, 455 | 4, 653, 031 | 8, 007, 777 |
| Herring, sea (including alewives and bluebacks) | 2, 182, 903 | 1, 368, 568 | 881, 760 | 777, 488 | 790, 393 | 731, 931 |
| Lake trout | 683, 614 | 473, 394 | 290, 180 | 194, 445 | 341, 448 | 208, 443 |
| Mackerel (except Spanish) | 4, 193, 907 | 2, 784, 937 | 1, 662, 424 | 762, 887 | 441, 465 | 1, 729, 468 |
| Perch, yellow | 144, 236 | 148, 180 | 111, 494 | 71, 793 | 69, 214 | 70, 640 |
| Pike, blue and sauger | 733, 081 | 703, 306 | 481, 563 | 543, 353 | 715, 963 | 849, 013 |
| Pike, yellow or wall-eyed | 302, 731 | 345, 565 | 284, 601 | 217, 270 | 225, 326 | 303, 657 |
| Pike (including pickerel, jacks and yellow jack) | 191, 014 | 265, 799 | 265, 529 | 246, 242 | 245, 952 | 213, 429 |
| Pollock fillets | 6, 314, 471 | 5, 209, 655 | 4, 414, 102 | 3, 622, 482 | 2, 763, 090 | 1, 344, 440 |
| Rosefish | 4, 083, 486 | 4, 012, 141 | 2, 571, 281 | 1, 095, 830 | 406, 449 | 1, 433, 229 |
| Sablefish (black cod) | 1, 451, 216 | 885, 550 | 297, 691 | 275, 054 | 153, 916 | 78, 199 |
| Salmon, chinook or king | 3, 366, 581 | 2, 555, 271 | 1, 811, 020 | 1, 247, 883 | 938, 828 | 999, 425 |
| Salmon, silver or coho | 3, 017, 576 | 1, 983, 502 | 978, 508 | 322, 889 | 175, 935 | 288, 363 |
| Salmon, fall and pink | 2, 375, 664 | 1, 656, 469 | 902, 604 | 622, 057 | 402, 366 | 298, 969 |
| Salmon, steelhead trout | 648, 022 | 529, 576 | 411, 195 | 363, 120 | 199, 510 | 107, 144 |
| Scup (porgies) | 542, 023 | 396, 051 | 270, 817 | 159, 801 | 146, 219 | 149, 537 |
| Shad and shad roe | 451, 525 | 361, 945 | 255, 310 | 187, 754 | 364, 570 | 512, 922 |
| Shellfish | 3, 450, 334 | 2, 561, 445 | 1, 892, 351 | 1, 261, 455 | 2, 019, 117 | 2, 399, 640 |
| Smelts, eulachon, etc | 1, 497, 328 | 1, 496, 831 | 1, 640, 522 | 1, 125, 545 | 1, 083, 661 | 1, 015, 825 |
| Squid | 556. 099 | 362, 009 | 155, 044 | 57, 302 | 627, 750 | 3, 211, 773 |
| Sturgeon and spoonbill cat | 154, 364 | 126, 589 | 91, 761 | 113, 197 | 121, 220 | 119, 730 |
| Suckers | 105, 069 | 84, 113 | 71, 724 | 64, 922 | 78, 957 | 657, 853 |
| Swordfish | 924, 685 | 1, 027, 883 | 971, 052 | 1, 328, 992 | 1, 053, 649 | 106, 690 |
| Weakfish (including southern "sea trout") | 537, 876 | 358, 334 | 204, 380 | 76, 612 | 41, 445 | 178. 747 |
| Whitefish | 796, 129 | 939, 363 | 1, 133, 660 | 1, 077, 267 | 876, 730 | 820, 062 |
| Whiting | 15, 743, 711 | 13, 616, 798 | 11, 127, 317 | 9, 045, 811 | 6, 984, 907 | 6, 128, 091 |
| Miscellaneous fish | 10, 953, 584 | 9, 618, 910 | 7, 327, 551 | 6, 360, 440 | 6, 322, 627 | 6, 436, 047 |
| Total | 87, 576, 140 | 69, 628, 623 | 51, 588, 013 | 42, 956, 628 | 40, 589, 493 | 48, 178, 012 |

| Species | Month ended the 15th of— | | | | | |
|---|---|---|---|---|---|---|
| | July | August | September | October | November | December |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Bluefish (all trade sizes) | 47, 556 | 63, 440 | 131, 025 | 250, 854 | 246, 791 | 370, 873 |
| Butterfish (all trade sizes) | 378, 868 | 617, 823 | 630, 306 | 694, 834 | 659, 016 | 610, 224 |
| Catfish | 251, 674 | 202, 539 | 230, 111 | 231, 110 | 226, 461 | 305, 107 |
| Cisco (Lake Erie) | 19, 258 | 40, 178 | 44, 627 | 46, 532 | 80, 586 | 191, 250 |
| Cisco (lake herring) including bluefin, blackfin, and chub | 443, 535 | 548, 195 | 603, 400 | 637, 452 | 1, 321, 329 | 1, 878, 276 |
| Cisco (tullibees, Canadian lakes) | 10, 517 | 27, 103 | 26, 680 | 23, 863 | 16, 062 | 19. 953 |
| Cod, haddock, hake, and pollock (except fillets of cod, haddock and pollock) | 1, 081, 167 | 1, 062, 614 | 1, 087, 493 | 1, 138, 169 | 1, 148, 212 | 1, 098, 207 |
| Cod fillets | 2, 767, 458 | 2, 995, 020 | 2, 955, 158 | 2, 620, 176 | 2, 408, 785 | 2, 517, 811 |
| Croaker | 1, 567, 547 | 1, 897, 810 | 1, 722, 397 | 1, 390, 388 | 1, 030, 521 | 834, 338 |
| Flounders | 642, 476 | 577, 623 | 498, 910 | 528, 488 | 603, 446 | 597, 541 |
| Haddock fillets | 5, 653, 334 | 6, 783, 907 | 7, 323, 162 | 8, 197, 526 | 7, 090, 766 | 6, 716, 962 |
| Halibut (all trade sizes) | 10, 789, 294 | 13, 130, 489 | 13, 187, 982 | 11, 607, 849 | 10, 144, 263 | 8, 329, 821 |
| Herring, sea (including alewives and bluebacks) | 656, 462 | 683, 688 | 512, 460 | 1, 322, 766 | 1, 879, 798 | 1, 978, 147 |
| Lake trout | 227, 797 | 243, 157 | 257, 141 | 345, 098 | 538, 818 | 505, 385 |
| Mackerel (except Spanish) | 1, 927, 864 | 2, 342, 935 | 1, 953, 702 | 2, 049, 734 | 2, 318, 949 | 3, 406, 190 |
| Perch, yellow | 89, 071 | 71, 244 | 113, 943 | 146, 182 | 248, 723 | 268, 701 |
| Pike, blue and sauger | 519, 750 | 304, 492 | 114, 035 | 127, 216 | 183, 675 | 153, 012 |
| Pike, yellow or wall-eyed | 295, 669 | 284, 896 | 267, 290 | 265, 744 | 241, 814 | 168. 451 |

*Holdings of frozen fishery products, 1937*—Continued

BY SPECIES AND MONTHS—Continued

| Species | Month ended the 15th of— | | | | | |
|---|---|---|---|---|---|---|
| | July | August | September | October | November | December |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Pike (including pickerel, jacks and yellow jack) | 207, 195 | 173, 264 | 125, 522 | 134, 477 | 207, 730 | 161, 230 |
| Pollock fillets | 1, 243, 381 | 1, 447, 204 | 1, 399, 307 | 880, 730 | 1, 171, 046 | 3, 514, 939 |
| Rosefish | 1, 929, 090 | 2, 387, 429 | 2, 243, 633 | 1, 277, 185 | 1, 923, 722 | 2, 501, 849 |
| Sablefish (black cod) | 168, 687 | 585, 166 | 1, 362, 832 | 2, 103, 128 | 2, 623, 682 | 2, 603, 741 |
| Salmon, chinook or king | 1, 324, 843 | 1, 812, 102 | 2, 505, 680 | 3, 422, 598 | 3, 626, 721 | 3, 297, 136 |
| Salmon, silver or coho | 416, 730 | 1, 285, 194 | 3, 425, 746 | 4, 603, 651 | 4, 902, 863 | 4, 216, 260 |
| Salmon, fall and pink | 256, 963 | 418, 761 | 561, 197 | 994, 721 | 4, 238, 583 | 4, 159, 631 |
| Salmon, steelhead trout | 116, 872 | 295, 815 | 442, 921 | 422, 343 | 381, 112 | 345, 544 |
| Scup (porgies) | 288, 387 | 316, 522 | 511, 566 | 462, 850 | 404, 042 | 306, 220 |
| Shad and shad roe | 499, 475 | 460, 433 | 461, 951 | 409, 307 | 422, 186 | 406, 243 |
| Shellfish | 3, 425, 101 | 3, 380, 792 | 4, 038, 639 | 4, 476, 255 | 5, 940, 926 | 5, 974, 142 |
| Smelts, eulachon, etc | 993, 860 | 952, 520 | 960, 680 | 889, 125 | 820, 592 | 743, 214 |
| Squid | 3, 098, 966 | 2, 939, 707 | 2, 713, 533 | 2, 488, 398 | 2, 380, 649 | 2, 043, 712 |
| Sturgeon and spoonbill cat | 106, 106 | 97, 291 | 132, 155 | 165, 338 | 155, 235 | 147, 233 |
| Suckers | 115, 493 | 119, 596 | 114, 202 | 107, 793 | 101, 008 | 202, 586 |
| Swordfish | 490, 452 | 576, 253 | 492, 903 | 398, 456 | 486, 810 | 1, 092, 329 |
| Weakfish (including southern "sea trout") | 356, 364 | 482, 500 | 967, 971 | 1, 513, 683 | 1, 571, 359 | 1, 309, 574 |
| Whitefish | 927, 883 | 969, 608 | 1, 062, 131 | 1, 072, 810 | 1, 008, 777 | 998, 420 |
| Whiting | 9, 186, 626 | 8, 610, 157 | 6, 856, 765 | 7, 415, 319 | 7, 083. 245 | 7, 562, 193 |
| Miscellaneous fish | 6, 807, 730 | 7, 016, 559 | 7, 282, 190 | 7, 487, 452 | 8, 263, 974 | 8, 354, 863 |
| Total | 59, 329, 501 | 66, 204, 026 | 69, 321, 346 | 72, 349, 600 | 78, 102, 277 | 79, 891, 308 |

BY GEOGRAPHICAL SECTIONS AND MONTHS[1]

[Expressed in thousands of pounds; that is, 000 omitted]

| Month ended the 15th of— | New England | Middle Atlantic | South Atlantic | North Central, East | North Central, West | South Central | Pacific[2] | Total |
|---|---|---|---|---|---|---|---|---|
| January | 34, 652 | 12, 684 | 2, 707 | 13, 701 | 7, 142 | 872 | 15, 818 | 87, 576 |
| February | 28, 707 | 11, 163 | 2, 187 | 11, 027 | 5, 782 | 649 | 10, 114 | 69, 629 |
| March | 22, 524 | 9, 250 | 1, 441 | 7, 867 | 4, 470 | 498 | 5, 538 | 51, 588 |
| April | 18, 758 | 7, 015 | 1, 096 | 6, 349 | 3, 520 | 396 | 5, 823 | 42, 957 |
| May | 15, 348 | 6, 994 | 971 | 6, 267 | 3, 369 | 642 | 6, 998 | 40, 589 |
| June | 17, 131 | 7, 605 | 2, 024 | 6, 908 | 3, 498 | 621 | 10, 391 | 48, 178 |
| July | 23, 034 | 8, 775 | 3, 031 | 6, 631 | 3, 873 | 502 | 13, 484 | 59, 330 |
| August | 24, 558 | 8, 914 | 3, 621 | 6, 400 | 4, 471 | 469 | 17, 771 | 66, 204 |
| September | 21, 468 | 10, 081 | 3, 429 | 6, 894 | 4, 379 | 578 | 22, 492 | 69, 321 |
| October | 21, 562 | 11, 225 | 3, 075 | 7, 078 | 4, 468 | 717 | 24, 225 | 72, 350 |
| November | 21, 519 | 12, 563 | 2, 714 | 8, 686 | 5, 146 | 1, 017 | 26, 457 | 78, 102 |
| December | 23, 719 | 14, 692 | 2, 934 | 8, 881 | 5, 714 | 915 | 23, 036 | 79, 891 |
| Average | 22, 748 | 10, 080 | 2, 436 | 8, 058 | 4, 653 | 656 | 15, 179 | 63, 810 |

[1] New England includes the 6 States of that section; Middle Atlantic—New York, New Jersey, and Pennsylvania; South Atlantic—Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida; North Central, East—Ohio, Indiana, Illinois, Michigan, and Wisconsin; North Central, West—Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas; South Central—Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Oklahoma, and Arkansas; and Pacific—Washington, Oregon, California, and Alaska.

[2] Includes a small amount of fish held in Colorado in the Mountain section.

## COLD-STORAGE HOLDINGS OF CURED FISH

During 1937 monthly cold-storage holdings of cured herring and mild-cured salmon averaged 22,918,000 pounds, which is an increase of 7 percent as compared with the average monthly holdings in 1936. The holdings during January were the largest, amounting to 26,097,617 pounds, and the smallest were in December, amounting to 17,299,938 pounds.

*Holdings of cured fish, 1937, by species and months*

| Month ended the 15th of— | Cured herring | Mild-cured salmon | Total |
|---|---|---|---|
| | *Pounds* | *Pounds* | *Pounds* |
| January | 18, 001, 751 | 8, 095, 866 | 26, 097, 617 |
| February | 18, 330, 859 | 5, 707, 047 | 24, 037, 906 |
| March | 17, 404, 805 | 4, 955, 148 | 22, 359, 953 |
| April | 18, 033, 069 | 4, 016, 397 | 22, 049, 466 |
| May | 22, 422, 267 | 3, 133, 848 | 25, 556, 115 |
| June | 20, 598, 513 | 3, 514, 453 | 24, 112, 966 |
| July | 18, 689, 631 | 4, 720, 282 | 23, 409, 913 |
| August | 17, 626, 521 | 5, 964, 964 | 23, 591, 485 |
| September | 16, 954, 488 | 7, 787, 570 | 24, 742, 058 |
| October | 14, 913, 228 | 7, 210, 858 | 22, 124, 086 |
| November | 12, 909, 212 | 6, 730, 592 | 19, 639, 804 |
| December | 10, 966, 065 | 6, 333, 873 | 17, 299, 938 |

## FOREIGN FISHERY TRADE

The foreign trade in fishery products of the United States in 1937 amounted to $65,202,767, of which $50,635,515 represents the value of these products imported for consumption, and $14,567,252, the value of exports of domestic fishery products. Compared with the previous year, there was an increase of 18 percent in total trade, 21 percent in the value of the imports, and 10 percent in the value of exports.

Imports consisted of 364,668,145 pounds of edible products, valued at $33,910,738, and nonedible products, valued at $16,724,777. Fishery exports consisted of 119,067,718 pounds of edible products, valued at $13,729,441, and nonedible products, valued at $837,811.

Import duties levied on fishery products imported during 1937 totaled $8,253,677.

*Exports of domestic fishery products, 1937* [1]

| Item | Quantity | Value |
|---|---|---|
| EDIBLE FISHERY PRODUCTS | | |
| Fish, fresh, frozen, or packed in ice: | | |
| Salmon ... pounds | 3, 394, 435 | $457, 286 |
| Other ... do | 1, 216, 599 | 130, 348 |
| Total ... do | 4, 611, 034 | 587, 634 |
| Fish, salted, pickled, or dry-cured. | | |
| Salmon ... do | 2, 232, 563 | 386, 974 |
| Cod, haddock, hake, pollock, cusk ... do | 1, 714, 987 | 119, 563 |
| Herring ... do | 1, 710, 001 | 66, 537 |
| Other ... do | 1, 000, 568 | 51, 009 |
| Total ... do | 6, 658, 119 | 624, 083 |
| Fish, smoked or kippered ... do | 301, 355 | 41, 317 |
| Fish, canned: | | |
| Salmon ... do | 37, 978, 553 | 6, 654, 801 |
| Sardines ... do | 51, 998, 236 | 3, 461, 855 |
| Mackerel ... do | 669, 739 | 43, 569 |
| Other ... do | 418, 041 | 76, 120 |
| Total ... do | 91, 064, 569 | 10, 236, 345 |
| Shellfish, not canned: | | |
| Oysters, fresh, in the shell ... do | 4, 523, 747 | 162, 660 |
| Oysters, fresh, shucked, frozen, or in ice ... do | 1, 732, 035 | 261, 261 |
| Shrimp fresh, frozen, or in ice ... do | 2, 715, 297 | 345, 896 |

[1] These statistics have been furnished by the Bureau of Foreign and Domestic Commerce, Department of Commerce.

### *Exports of domestic fishery products, 1937* —Continued

| Item | Quantity | Value |
|---|---|---|
| EDIBLE FISHERY PRODUCTS—continued | | |
| Shellfish, not canned—Continued. | | |
| Shrimp, dried ... pounds | 1, 459, 643 | $275, 325 |
| Other shellfish, fresh, frozen, or in ice, or dried ... do | 229, 048 | 28, 501 |
| Total ... do | 10, 659, 770 | 1, 073, 643 |
| Shellfish, canned: | | |
| Shrimp ... do | 4, 562, 962 | 911, 322 |
| Other ... do | 967, 288 | 169, 755 |
| Total ... do | 5, 530, 250 | 1, 081, 077 |
| Other fish products ... do | 242, 621 | 85, 342 |
| Total edible products ... do | 119, 067, 718 | 13, 729, 441 |
| NONEDIBLE FISHERY PRODUCTS | | |
| Marine-animal oils ... do | 1, 949, 014 | 304, 298 |
| Sponges ... do | 54, 686 | 72, 603 |
| Fish meal for feed ... tons | 1, 051 | 42, 525 |
| Furs, fur-seal, dressed ... number | 2, 867 | 67, 529 |
| Oyster shells ... tons | 53, 320 | 350, 856 |
| Total nonedible products | | 837, 811 |
| Grand total | | 14, 567, 252 |

### *Imports of fishery products entered for consumption, 1937*[1]

| Item | Pounds | Value |
|---|---|---|
| EDIBLE FISHERY PRODUCTS | | |
| Fish, fresh or frozen: | | |
| Whole or beheaded, or eviscerated, or both: | | |
| Fresh-water fish, not elsewhere specified: | | |
| Whitefish | 12, 252, 325 | $1, 575, 535 |
| Yellow pike | 9, 034, 990 | 814, 369 |
| Jacks or grass pike | 3, 352, 137 | 172, 215 |
| Lake trout | 4, 754, 041 | 552, 830 |
| Yellow perch | 2, 037, 064 | 162, 374 |
| Tullibees | 580, 015 | 44, 385 |
| Lake herring and ciscoes | 1, 373, 017 | 171, 762 |
| Chubs | 1, 174, 251 | 157, 449 |
| Mullet *(catostomus)* | 691, 250 | 35, 679 |
| Saugers | 8, 152, 080 | 427, 918 |
| Fresh-water fish, not elsewhere specified | 12, 189, 192 | 761, 981 |
| Eels | 817, 332 | 61, 358 |
| Salmon | 6, 616, 373 | 592, 394 |
| Cod, haddock, hake, pollock, and cusk | 1, 660, 963 | 77, 064 |
| Halibut: | | |
| Fresh | 4, 249, 717 | 429, 241 |
| Frozen | 708, 235 | 68, 248 |
| Mackerel | 1, 881, 374 | 99, 067 |
| Sturgeon | 947, 206 | 190, 649 |
| Swordfish: | | |
| Fresh | 1, 280, 305 | 273, 717 |
| Frozen | 5, 236, 408 | 419, 343 |
| Fish, not specially provided for | 8, 074, 890 | 377, 663 |
| Whether or not whole: | | |
| Smelts | 6, 295, 625 | 594, 927 |
| Tuna fish | 14, 410, 832 | 866, 825 |
| Sea herring: | | |
| Fresh | 24, 617, 177 | 153, 595 |
| Frozen | 2, 170, 145 | 83, 646 |
| Filleted, skinned, boned, sliced, or divided, not specially provided for | 10, 870, 250 | 1, 073, 333 |
| Total | 145, 427, 194 | 10, 237, 567 |

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[1] These statistics have been furnished by the Bureau of Foreign and Domestic Commerce, Department of Commerce.

*Imports of fishery products entered for consumption, 1937*—Continued

| Item | Pounds | Value |
|---|---|---|
| EDIBLE FISHERY PRODUCTS—continued | | |
| Fish, salted, dried, smoked, pickled, or preserved: | | |
| Dried and unsalted: | | |
| Cod, haddock, hake, pollock, and cusk | 78, 060 | $5, 267 |
| Other | 3, 421, 380 | 418, 946 |
| In oil or in oil and other substances: | | |
| Sardines | 28, 727, 105 | 3, 842, 951 |
| Anchovies | 2, 170, 033 | 865, 194 |
| Tuna fish | 11, 053, 349 | 2, 033, 958 |
| Antipasto | 271, 020 | 103, 993 |
| Other | 549, 612 | 117, 368 |
| Not in oil or in oil and other substances: | | |
| In airtight containers weighing, with contents, not over 15 pounds each: | | |
| Anchovies | 1, 581, 454 | 164, 726 |
| Salmon | 6, 712, 731 | 411, 471 |
| Herring and sardines | 11, 792, 040 | 907, 787 |
| Fish cakes, balls, and pudding | 2, 188, 313 | 151, 916 |
| Other | 1, 899, 189 | 243, 175 |
| Pickled or salted: | | |
| Not in oil, etc., and not in airtight containers weighing, with contents, 15 pounds or less each: | | |
| Salmon | 124, 031 | 11, 612 |
| Cod, haddock, hake, pollock, and cusk, neither skinned nor boned (except that vertebral column may be removed): | | |
| Containing not more than 43 percent moisture by weight | 2, 695, 239 | 150, 081 |
| Containing more than 43 percent moisture by weight | 46, 940, 368 | 2, 008, 136 |
| Cod, haddock, hake, pollock, and cusk, skinned or boned | 2, 089, 597 | 208, 711 |
| Herring: | | |
| In containers (not airtight), weighing, with contents, not more than 15 pounds each | 209 | 47 |
| In containers, containing not more than 10 pounds of herring | 9, 080, 093 | 380, 740 |
| Other herring in bulk or containers | 26, 177, 847 | 1, 096, 060 |
| Mackerel, in bulk or in containers weighing, with contents, more than 15 pounds each | 6, 435, 254 | 407, 538 |
| Alewives, in bulk or in containers weighing, with contents, more than 15 pounds each | 26, 250 | 852 |
| Pickled or salted, not specially provided for: | | |
| In bulk or in containers weighing, with contents, more than 15 pounds each | 1, 236, 229 | 95, 733 |
| In containers (not airtight) weighing, with contents, not more than 15 pounds each | 1, 131 | 163 |
| Smoked or kippered: | | |
| Not in oil, and not in airtight containers weighing, with contents, 15 pounds or less each: | | |
| Salmon | 3, 896 | 2, 252 |
| Herring: | | |
| Whole or beheaded: | | |
| Hard, dry-smoked | 1, 690, 517 | 49, 405 |
| Other | 319, 520 | 23, 950 |
| Boned, whether or not skinned | 51, 325 | 4, 431 |
| Eviscerated, split, skinned, or divided, not boned | 953, 878 | 78, 665 |
| Cod, haddock, hake, pollock, and cusk: | | |
| Whole, or beheaded, or eviscerated, or both | 929, 574 | 93, 782 |
| Filleted, skinned, boned, sliced, or divided | 1, 875, 059 | 189, 251 |
| Prepared or preserved, not specially provided for: | | |
| In containers weighing, with contents, not more than 15 pounds each | 34, 055 | 3, 266 |
| In bulk or in containers weighing, with contents, more than 15 pounds each | 90, 858 | 7, 534 |
| Fish paste and fish sauce | 194, 400 | 46, 857 |
| Total | 171, 393, 616 | 14, 125, 818 |
| Caviar and other fish roe: | | |
| Not boiled: | | |
| Sturgeon | 225, 845 | 320, 753 |
| Fish roe, not specially provided for | 78, 763 | 20, 650 |
| Boiled, packed in airtight containers | 132, 801 | 17, 453 |
| Total | 437, 409 | 358, 856 |
| Shellfish: | | |
| Crab meat, crab sauce, and crab paste | 11, 156, 566 | 3, 675, 665 |
| Oysters, oyster juice, or either in combination with other substances, in airtight containers | 229, 313 | 52, 664 |
| Razor clams, canned | 11, 539 | 765 |
| Clams (except razor clams) and clams in combination with other substances (except clam chowder) | 739, 755 | 136, 740 |
| Clam chowder, clam juice, and clam juice in combination with other substances | 7, 696 | 987 |
| Lobsters (including spiny lobsters and crawfish): | | |
| Not canned | 14, 711, 594 | 3, 332, 344 |
| Canned | 834, 416 | 417, 822 |
| Turtles | 684, 523 | 41, 062 |

*Imports of fishery products entered for consumption, 1937*—Continued

| Item | Pounds | Value |
|---|---|---|
| EDIBLE FISHERY PRODUCTS—continued | | |
| Shellfish—Continued. | | |
| Crabs: | | |
| Fresh or frozen (not crab meat) | 13,910 | $865 |
| Prepared or preserved, not specially provided for | 3,322 | 705 |
| Clams, quahaugs, not in airtight containers: | | |
| Fresh or frozen | 4,996,780 | 75,422 |
| Prepared or preserved | 28,000 | 3,092 |
| Shrimp and prawns | 2,400,075 | 199,326 |
| Scallops: | | |
| Fresh but not frozen | 1,151,504 | 198,390 |
| Other | 1,233,964 | 164,596 |
| Oysters, not in airtight containers: | | |
| Fresh or frozen (except seed oysters) | 56,347 | 8,274 |
| Other | 2,552,101 | 102,720 |
| Shellfish, not specially provided for | 6,411,123 | 751,392 |
| Lobster paste and sauce | 28,263 | 8,168 |
| Pastes and sauces of shellfish, not specially provided for | 159,135 | 17,498 |
| Total | 47,409,926 | 9,188,497 |
| Total edible fishery products | 364,668,145 | 33,910,738 |
| NONEDIBLE FISHERY PRODUCTS | | |
| Marine-animal oils: | *Quantity* | *Value* |
| Cod oil ... gallons | 2,954,156 | 1,188,824 |
| Cod-liver oil ... do | 5,915,964 | 3,866,971 |
| Eulachon oil ... do | 303 | 130 |
| Herring oil ... do | 4,904 | 1,183 |
| Seal oil ... do | 12,376 | 4,675 |
| Sod oil ... do | 49,545 | 16,406 |
| Whale oil: | | |
| Sperm, crude ... do | 1,334,709 | 355,972 |
| Sperm, refined or otherwise processed ... do | 42,154 | 15,630 |
| Whale oil, not specially provided for ... do | 5,925,920 | 1,658,751 |
| Marine-animal and fish oils, not specially provided for ... do | 111,006 | 102,152 |
| Total ... do | 16,351,037 | 7,210,694 |
| Pearls and imitation pearls: | | |
| Pearls and parts, not strung or set: | | |
| Natural | | 719,170 |
| Cultured or cultivated | | 385,410 |
| Imitation pearls, half pearls and hollow or filled | | 10,983 |
| Imitation pearl beads: | | |
| Hollow or filled | | 67,956 |
| Other solid imitation pearl beads: | | |
| Valued at not more than ¼ cent per inch ... inches | 135,101,965 | 152,826 |
| Valued at more than ¼, but not more than 1 cent per inch ... do | 140,075 | 652 |
| Valued at more than 1, but not more than 5 cents per inch ... do | 12,044 | 170 |
| Valued at more than 5 cents per inch ... do | 1,330 | 221 |
| Valued at not more than 10 cents per inch ... do | 86,100 | 76 |
| Total | | 1,337,464 |
| Shells and buttons of pearl or shell: | | |
| Shells, unmanufactured: | | |
| Green snail shell ... pounds | 223,326 | 43,011 |
| Mother-of-pearl ... do | 10,142,840 | 2,230,966 |
| Shells, not specially provided for, including tortoise shells ... do | 10,419,756 | 29,294 |
| Shells and mother-of-pearl, engraved, cut, ornamented, or manufactured | | 69,467 |
| Shell pearl buttons: | | |
| Ocean ... gross | 286,069 | 94,228 |
| Fresh-water ... do | 228,805 | 52,908 |
| Buttons (from Philippine Islands) ... do | 836,260 | 283,839 |
| Total | | 2,803,713 |
| Sponges: | | |
| Sheepswool ... pounds | 155,696 | 309,457 |
| Yellow and grass ... do | 306,139 | 100,253 |
| Velvet ... do | 52,956 | 67,811 |
| Other ... do | 66,057 | 109,409 |
| Manufactures of sponges ... do | 1,058 | 690 |
| Total ... do | 581,906 | 587,620 |
| Agar agar ... do | 704,258 | 418,383 |
| Ambergris ... do | 39 | 4,775 |
| Cod-liver oil cake and cod-liver oil cake meal ... do | 1,216,605 | 28,693 |
| Cuttlefish bone ... do | 535,590 | 39,428 |
| Aquarium fish | | 42,700 |
| Goldfish, live ... number | 444,178 | 5,411 |

*Imports of fishery products entered for consumption, 1937*—Continued

| Item | Quantity | Value |
|---|---|---|
| NONEDIBLE FISHERY PRODUCTS—continued | | |
| Fish for other than human consumption, not elsewhere specified | | $11,105 |
| Fish livers ... pounds | 2,473,962 | 421,141 |
| Fish sounds ... do | 160,808 | 32,635 |
| Fish scrap and fish meal ... tons | 92,772 | 3,357,254 |
| Isinglass ... pounds | 85,289 | 39,137 |
| Kelp ... do | 1,131,063 | 17,812 |
| Skins, fish, raw or salted ... do | 1,335,172 | 58,665 |
| Skins, seal, raw (not fur skins) ... do | 1,953,833 | 291,600 |
| Spermaceti wax ... do | 80,339 | 14,742 |
| Whalebone, unmanufactured | | 1,469 |
| Whalebone, manufactures of | | 336 |
| Total | | 4,785,286 |
| Total, nonedible fishery products | | 16,724,777 |
| Grand total | | 50,635,515 |

## FISHERIES OF THE NEW ENGLAND STATES

(Area XXII)[4]

The yield of the commercial fisheries of the New England States (Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut) during 1937 amounted to 670,864,300 pounds, valued at $19,937,288 to the fishermen, representing an increase of 2 percent in volume and 11 percent in value as compared with the catch in 1935, the most recent previous year for which catch statistics are available. These fisheries gave employment to 19,624 fishermen, as compared with 18,449 in 1935.

There were 400 fishery wholesale and manufacturing establishments in the 5 States in 1937, as compared with 380 in 1935 when the most recent survey of these establishments was made. In 1937 these establishments employed 12,122 persons, paid $7,705,479 in salaries and wages, and produced manufactured products (canned, cured, packaged, and byproducts) valued at $24,038,947. In 1935 the wholesale and manufacturing firms employed 10,561 persons, paid $6,456,456 in salaries and wages, and produced manufactured products valued at $22,838,942.

*Fisheries of the New England States, 1937*

SUMMARY OF CATCH

| Product | Maine | | New Hampshire | | Massachusetts | | Rhode Island | | Connecticut | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Fish | 83,578,600 | $897,085 | 34,000 | $2,930 | 513,858,500 | $11,998,732 | 9,422,300 | $299,040 | 8,273,600 | $325,981 | 615,167,000 | $13,523,768 |
| Shellfish, etc | 17,600,700 | 1,908,922 | 629,800 | 93,111 | 20,251,900 | 2,198,727 | 9,425,100 | 1,098,924 | 7,789,800 | 1,113,836 | 55,697,300 | 6,413,520 |
| Total | 101,179,300 | 2,806,007 | 663,800 | 96,041 | 534,110,400 | 14,197,459 | 18,847,400 | 1,397,964 | 16,063,400 | 1,439,817 | 670,864,300 | 19,937,288 |

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[4] This is the number given this area by the North American Council on Fishery Investigations. It should be explained that there are included under this area craft whose principal fishing ports are in the area but at times fish elsewhere. Notable examples are the groundfish fishery in area XXI and the mackerel and southern trawl fisheries in area XXIII. For a clearer understanding of the statistics published in this section, the reader is referred to the section in the latter part of this document entitled "Statistical survey procedure."

### *Fisheries of the New England States, 1937*—Continued

OPERATING UNITS: BY STATES

| Item | Maine | New Hampshire | Massachusetts | Rhode Island | Connecticut | Total |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 482 | ---------- | 4,258 | 289 | 316 | 5,345 |
| On boats and shore: | | | | | | |
| Regular | 2,606 | 119 | 3,614 | 429 | 295 | 7,063 |
| Casual | 3,211 | 53 | 2,609 | 768 | 575 | 7,216 |
| Total | 6,299 | 172 | 10,481 | 1,486 | 1,186 | 19,624 |
| Vessels: | | | | | | |
| Steam | ---------- | ---------- | 29 | 6 | 4 | 39 |
| Net tonnage | ---------- | ---------- | 4,942 | 157 | 878 | 5,977 |
| Motor | 113 | ---------- | 381 | 68 | 68 | 630 |
| Net tonnage | 1,115 | ---------- | 15,160 | 788 | 1,267 | 18,330 |
| Total vessels | 113 | ---------- | 410 | 74 | 72 | 669 |
| Total net tonnage | 1,115 | ---------- | 20,102 | 945 | 2,145 | 24,307 |
| Boats: | | | | | | |
| Motor | 2,083 | 45 | 1,754 | 357 | 230 | 4,469 |
| Other | 1,907 | 64 | 1,675 | 625 | 461 | 4,732 |
| Accessory boats | 178 | ---------- | 457 | 62 | 15 | 712 |
| Apparatus: | | | | | | |
| Purse seines: | | | | | | |
| Mackerel | 14 | ---------- | 77 | ---------- | 1 | 92 |
| Length, yards | 5,300 | ---------- | 36,002 | ---------- | 120 | 41,422 |
| Other | 9 | ---------- | 2 | ---------- | ---------- | 11 |
| Length, yards | 1,990 | ---------- | 1,000 | ---------- | ---------- | 2,990 |
| Haul seines | 31 | ---------- | 14 | 16 | 37 | 98 |
| Length, yards | 3,030 | ---------- | 488 | 2,262 | 3,723 | 9,503 |
| Stop seines | 78 | ---------- | ---------- | ---------- | ---------- | 78 |
| Length, yards | 35,680 | ---------- | ---------- | ---------- | ---------- | 35,680 |
| Gill nets: | | | | | | |
| Anchor | 785 | ---------- | 1,475 | 4 | ---------- | 2,264 |
| Square yards | 278,631 | ---------- | 511,536 | 464 | ---------- | 790,631 |
| Drift | 500 | ---------- | 3,599 | 28 | 30 | 4,157 |
| Square yards | 112,373 | ---------- | 1,085,581 | 30,480 | 58,450 | 1,286,884 |
| Stake | 163 | ---------- | ---------- | ---------- | 24 | 187 |
| Square yards | 29,238 | ---------- | ---------- | ---------- | 4,740 | 33,978 |
| Lines: | | | | | | |
| Hand | 4,921 | 750 | 402 | 244 | 117 | 6,434 |
| Hooks | 5,520 | 750 | 1,061 | 434 | 147 | 7,912 |
| Trawl | 15,961 | 50 | 29,020 | 69 | ---------- | 45,100 |
| Hooks | 858,990 | 2,500 | 1,583,818 | 28,643 | ---------- | 2,473,951 |
| Troll | ---------- | ---------- | ---------- | 117 | ---------- | 117 |
| Hooks | ---------- | ---------- | ---------- | 117 | ---------- | 117 |
| Trot with hooks | ---------- | ---------- | ---------- | 3 | 26 | 29 |
| Hooks | ---------- | ---------- | ---------- | 500 | 2,800 | 3,300 |
| Pound nets | ---------- | ---------- | 87 | 36 | 15 | 138 |
| Floating traps | 22 | ---------- | 50 | 36 | ---------- | 108 |
| Weirs | 216 | ---------- | 4 | ---------- | ---------- | 220 |
| Fyke nets | 27 | ---------- | 18 | 105 | 97 | 247 |
| Dip nets | 60 | ---------- | 203 | 10 | 215 | 488 |
| Scap nets | ---------- | ---------- | ---------- | ---------- | 12 | 12 |
| Bag nets | 124 | 31 | ---------- | ---------- | ---------- | 155 |
| Push nets | ---------- | ---------- | 117 | ---------- | ---------- | 117 |
| Otter trawls | 54 | ---------- | 346 | 49 | 60 | 509 |
| Yards at mouth | 1,288 | ---------- | 10,399 | 1,143 | 1,538 | 14,368 |
| Box traps | 11 | ---------- | ---------- | ---------- | ---------- | 11 |
| Pots: | | | | | | |
| Crab | 160 | ---------- | 3,470 | 30 | ---------- | 3,660 |
| Eel | 120 | ---------- | 1,105 | 858 | 989 | 3,072 |
| Lobster | 185,339 | 3,459 | 72,290 | 29,270 | 15,772 | 306,130 |
| Periwinkle and cockle | ---------- | ---------- | 80 | 875 | ---------- | 955 |
| Harpoons | 69 | ---------- | 74 | 50 | 16 | 209 |
| Spears | 5 | ---------- | 22 | 34 | 6 | 67 |
| Dredges: | | | | | | |
| Clam | ---------- | ---------- | 94 | 18 | ---------- | 112 |
| Yards at mouth | ---------- | ---------- | 39 | 15 | ---------- | 54 |
| Mussel | ---------- | ---------- | ---------- | 4 | ---------- | 4 |
| Yards at mouth | ---------- | ---------- | ---------- | 4 | ---------- | 4 |
| Oyster | ---------- | ---------- | 35 | 37 | 78 | 150 |
| Yards at mouth | ---------- | ---------- | 35 | 55 | 100 | 190 |
| Scallop | 134 | ---------- | 2,857 | 705 | ---------- | 3,696 |
| Yards at mouth | 194 | ---------- | 2,455 | 574 | ---------- | 3,223 |
| Tongs: | | | | | | |
| Oyster | ---------- | ---------- | 37 | 48 | 38 | 123 |
| Other | ---------- | ---------- | 138 | 572 | 61 | 771 |
| Rakes: | | | | | | |
| Oyster | ---------- | ---------- | ---------- | 37 | 2 | 39 |
| Other | 3 | ---------- | 823 | 103 | 63 | 992 |
| Forks | ---------- | ---------- | 463 | 15 | ---------- | 478 |
| Hoes | 2,104 | 105 | 1,782 | 56 | 35 | 4,082 |

## *Fisheries of the New England States, 1937*—Continued

### CATCH: BY STATES

| Species | Maine |  | New Hampshire |  | Massachusetts |  | Rhode Island |  | Connecticut |  | Total |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 2,818,000 | $10,936 |  |  | 1,085,900 | $8,283 | 218,200 | $1,916 | 84,800 | $851 | 4,206,900 | $21,986 |
| Anchovies |  |  |  |  | 200 | 4 | 32,000 | 290 |  |  | 32,200 | 294 |
| Bluefish |  |  |  |  | 46,900 | 4,019 | 140,100 | 10,256 | 33,600 | 4,654 | 220,600 | 18,929 |
| Bonito |  |  |  |  | 4,600 | 315 | 43,000 | 3,733 |  |  | 47,600 | 4,048 |
| Butterfish | 9,900 | 620 |  |  | 2,250,400 | 87,407 | 570,400 | 19,031 | 39,100 | 2,529 | 2,869,800 | 109,587 |
| Carp |  |  |  |  | 1,000 | 40 |  |  | 39,500 | 3,055 | 40,500 | 3,095 |
| Catfish and bullheads |  |  |  |  |  |  |  |  | 300 | 2 | 300 | 2 |
| Cod | 7,049,500 | 146,981 | 1,000 | $30 | 126,327,600 | 2,472,225 | 1,067,100 | 31,498 | 159,400 | 6,127 | 134,604,600 | 2,656,861 |
| Crevalle |  |  |  |  |  |  | 2,000 | 20 |  |  | 2,000 | 20 |
| Croaker |  |  |  |  | 866,400 | 28,057 |  |  |  |  | 866,400 | 28,057 |
| Cunner |  |  |  |  | 27,800 | 894 | 14,100 | 175 | 1,000 | 20 | 42,900 | 1,089 |
| Cusk | 1,552,900 | 26,825 | 1,000 | 30 | 8,618,500 | 158,798 |  |  |  |  | 10,172,400 | 185,653 |
| Drum, red |  |  |  |  | 2,800 | 16 |  |  |  |  | 2,800 | 16 |
| Eels: |  |  |  |  |  |  |  |  |  |  |  |  |
| Common | 59,300 | 5,326 |  |  | 92,700 | 8,184 | 177,400 | 14,330 | 74,700 | 7,060 | 404,100 | 34,900 |
| Conger |  |  |  |  | 45,600 | 669 | 15,900 | 439 | 1,400 | 74 | 62,900 | 1,182 |
| Flounders: |  |  |  |  |  |  |  |  |  |  |  |  |
| Gray sole | 958,300 | 28,472 |  |  | 9,985,000 | 475,150 |  |  |  |  | 10,943,300 | 503,622 |
| Lemon sole |  |  |  |  | 3,268,700 | 226,766 |  |  | 24,800 | 1,984 | 3,293,500 | 228,750 |
| Yellowtail and dab | 295,200 | 4,257 |  |  | 16,607,800 | 377,242 | 544,600 | 10,908 | 2,616,900 | 73,526 | 20,064,500 | 465,933 |
| Blackback | 769,100 | 22,939 |  |  | 5,541,000 | 217,657 | 1,181,400 | 38,587 | 3,174,400 | 122,244 | 10,665,900 | 401,427 |
| Fluke |  |  |  |  | 1,960,400 | 167,092 | 91,300 | 4,551 | 407,200 | 33,376 | 2,458,900 | 205,019 |
| Unclassified | 28,100 | 1,648 |  |  | 747,700 | 23,348 |  |  |  |  | 775,800 | 24,996 |
| Goosefish |  |  |  |  | 16,600 | 178 |  |  | 20,000 | 150 | 36,600 | 328 |
| Grayfish |  |  |  |  | 27,600 | 528 | 4,000 | 50 |  |  | 31,600 | 578 |
| Haddock | 2,836,700 | 96,749 | 2,000 | 80 | 166,583,500 | 4,072,967 | 1,200 | 39 | 63,400 | 2,515 | 169,486,800 | 4,172,350 |
| Hake | 7,796,400 | 79,758 | 2,000 | 40 | 17,274,200 | 282,682 | 17,900 | 248 | 18,100 | 566 | 25,108,600 | 363,294 |
| Halibut | 23,000 | 3,320 |  |  | 2,415,700 | 253,146 |  |  | 700 | 77 | 2,439,400 | 256,543 |
| Herring, sea | 49,952,400 | 266,377 |  |  | 2,894,400 | 28,010 | 195,600 | 2,747 |  |  | 53,042,400 | 297,134 |
| Herring smelt |  |  |  |  | 10,200 | 167 |  |  |  |  | 10,200 | 167 |
| Hickory shad |  |  |  |  |  |  | 11,100 | 174 | 1,700 | 85 | 12,800 | 259 |
| King whiting or "kingfish" |  |  |  |  | 11,600 | 315 | 2,900 | 118 |  |  | 14,500 | 433 |
| Lamprey |  |  |  |  |  |  |  |  | 2,800 | 300 | 2,800 | 300 |
| Launce |  |  |  |  | 268,500 | 3,383 |  |  |  |  | 268,500 | 3,383 |
| Mackerel | 1,543,800 | 48,603 |  |  | 21,165,700 | 886,092 | 594,300 | 19,832 | 77,000 | 4,702 | 23,380,800 | 959,229 |
| Menhaden |  |  |  |  | 39,000 | 357 | 129,000 | 856 | 126,000 | 1,175 | 294,000 | 2,388 |
| Minnows |  |  |  |  |  |  |  |  | 2,100 | 700 | 2,100 | 700 |
| Mummichog |  |  |  |  |  |  |  |  | 1,000 | 200 | 1,000 | 200 |
| Pollock | 6,699,800 | 60,363 |  |  | 30,614,000 | 459,767 | 250,100 | 3,571 | 2,600 | 88 | 37,566,500 | 523,789 |
| Rosefish | 140,300 | 973 |  |  | 58,215,600 | 886,506 |  |  |  |  | 58,355,900 | 887,479 |
| Salmon | 24,200 | 6,002 |  |  | 4,400 | 287 |  |  |  |  | 28,600 | 6,289 |
| Scup or porgy |  |  |  |  | 8,234,500 | 175,942 | 1,678,400 | 32,984 | 149,900 | 4,389 | 10,061,900 | 213,315 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sea bass | 900 | 46 | | | 2,315,900 | 125,714 | 146,500 | 10,020 | 60,100 | 5,160 | 2,553,400 | 140,940 |
| Sea robin | | | | | 55,700 | 829 | 102,600 | 694 | 22,400 | 448 | 180,700 | 1,971 |
| Shad | 9,300 | 378 | | | 48,400 | 2,286 | 4,800 | 467 | 382,900 | 24,164 | 445,400 | 27,295 |
| Sharks | 35,000 | 460 | | | 88,700 | 1,989 | 3,400 | 55 | | | 127,100 | 2,504 |
| Silversides | | | | | | | 400 | 4 | | | 400 | 4 |
| Skates | | | | | 41,100 | 566 | 302,100 | 1,499 | 56,000 | 588 | 399,200 | 2,653 |
| Skipper or "billfish" | | | | | 600 | 68 | | | | | 600 | 68 |
| Smelt | 608,200 | 66,643 | 28,000 | 2,750 | 1,500 | 300 | | | 1,700 | 710 | 639,400 | 70,403 |
| Spot | | | | | 1,300 | 17 | 400 | 8 | | | 1,700 | 25 |
| Squeteagues, or "sea trout," gray | | | | | 128,200 | 5,843 | 64,200 | 4,634 | 8,500 | 899 | 200,900 | 11,376 |
| Squirrel hake | | | | | | | | | 3,600 | 90 | 3,600 | 90 |
| Striped bass | | | | | 120,600 | 9,771 | 317,100 | 24,785 | 12,800 | 1,864 | 450,500 | 36,420 |
| Sturgeon | 1,200 | 92 | | | 7,300 | 662 | 900 | 76 | 100 | 13 | 9,500 | 843 |
| Suckers | 30,500 | 762 | | | | | | | 108,900 | 4,263 | 139,400 | 5,025 |
| Swordfish | 72,300 | 11,379 | | | 1,413,200 | 229,273 | 333,500 | 43,603 | 49,000 | 6,685 | 1,868,000 | 290,940 |
| Tautog | 100 | 4 | | | 83,900 | 3,890 | 99,500 | 3,591 | 20,900 | 1,543 | 204,400 | 9,028 |
| Thimble-eyed mackerel | | | | | | | 4,700 | 94 | | | 4,700 | 94 |
| Tilefish | 21,000 | 840 | | | 15,600 | 631 | | | | | 36,600 | 1,471 |
| Tomcod | 8,200 | 144 | | | | | | | | | 8,200 | 144 |
| Tuna | 201,600 | 5,884 | | | 685,000 | 22,700 | 42,200 | 2,991 | | | 928,800 | 31,575 |
| Turbot | | | | | 100 | 3 | | | | | 100 | 3 |
| White perch | | | | | 2,200 | 29 | 1,000 | 180 | | | 3,200 | 209 |
| Whiting | 200 | 4 | | | 21,037,800 | 239,214 | 1,017,000 | 9,986 | 425,200 | 9,105 | 22,480,200 | 258,309 |
| Wolffish | 32,900 | 274 | | | 2,524,900 | 48,454 | | | | | 2,557,800 | 48,728 |
| Yellow perch | 300 | 26 | | | | | | | | | 300 | 26 |
| Total | 83,578,600 | 897,085 | 34,000 | 2,930 | 513,858,500 | 11,998,732 | 9,422,300 | 299,040 | 8,273,600 | 325,981 | 615,167,000 | 13,523,768 |
| SHELLFISH, ETC. | | | | | | | | | | | | |
| Crabs: | | | | | | | | | | | | |
| Hard | 609,700 | 16,723 | | | 1,565,700 | 40,283 | 332,400 | 9,973 | 6,600 | 424 | 2,514,400 | 67,403 |
| Rock | | | | | | | 1,600 | 80 | | | 1,600 | 80 |
| Soft and peelers | | | | | | | 400 | 150 | 200 | 67 | 600 | 217 |
| Lobsters | 7,348,500 | 1,387,436 | 155,800 | 37,511 | 2,134,900 | 560,291 | 773,800 | 178,083 | 522,900 | 140,712 | 10,935,900 | 2,304,033 |
| Shrimp | 200 | 3 | | | 6,800 | 475 | | | | | 7,000 | 478 |
| Clams: | | | | | | | | | | | | |
| Hard, public [1] | 13,200 | 960 | | | 1,300,500 | 109,332 | 2,214,400 | 280,073 | 202,700 | 42,768 | 3,730,800 | 433,133 |
| Hard, private [1] | | | | | 10,000 | 726 | 66,900 | 8,205 | 800 | 150 | 77,700 | 9,081 |
| Razor | | | | | 725,500 | 18,888 | | | | | 725,500 | 18,888 |
| Soft, public [2] | 8,415,000 | 364,700 | 474,000 | 55,600 | 5,514,100 | 491,327 | 170,400 | 11,693 | 51,200 | 6,754 | 14,624,700 | 930,074 |
| Soft, private [2] | | | | | 52,500 | 4,375 | | | | | 52,500 | 4,375 |
| Surf or skimmer | | | | | 1,700 | 100 | 8,000 | 670 | | | 9,700 | 770 |
| Conchs | | | | | | | | | 19,200 | 815 | 19,200 | 815 |
| Mussels, sea | 10,800 | 275 | | | | | 5,000 | 479 | | | 15,800 | 754 |

[1] Statistics on hard clams used in this table are based on yields of 11 pounds of meats per bushel in Maine; 11.01 pounds in Massachusetts; 12 pounds in Rhode Island; and 12.12 pounds in Connecticut.

[2] Statistics on soft clams used in this table are based on yields of 15 pounds of meats per bushel in Maine and New Hampshire; 14.15 pounds in Massachusetts; and 20 pounds in Rhode Island and Connecticut.

## *Fisheries of the New England States, 1937*—Continued

### CATCH: BY STATES—Continued

| Species | Maine | | New Hampshire | | Massachusetts | | Rhode Island | | Connecticut | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SHELLFISH, ETC—continued | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Oysters, market:[3] | | | | | | | | | | | | |
| Public, spring | | | | | 23,400 | $8,225 | 37,200 | $4,840 | 8,100 | $966 | 68,700 | $14,031 |
| Public, fall | | | | | | | 69,500 | 9,557 | 48,600 | 5,637 | 118,100 | 15,194 |
| Private, spring | | | | | 184,300 | 67,778 | 1,841,600 | 232,723 | 3,296,000 | 403,418 | 5,321,900 | 703,919 |
| Private, fall | | | | | | | 2,381,900 | 323,768 | 3,524,800 | 493,111 | 5,906,700 | 816,879 |
| Periwinkles and cockles | 2,400 | $200 | | | 9,500 | 582 | 60,400 | 1,632 | | | 72,300 | 2,414 |
| Scallops: | | | | | | | | | | | | |
| Bay | 71,400 | 10,276 | | | 1,292,100 | 255,617 | 99,400 | 19,359 | 89,600 | 18,250 | 1,552,500 | 303,502 |
| Sea | 679,400 | 75,655 | | | 4,976,900 | 553,496 | 2,700 | 236 | | | 5,659,000 | 629,387 |
| Squid | 14,300 | 92 | | | 1,914,300 | 24,888 | 1,347,500 | 16,563 | 19,100 | 764 | 3,295,200 | 42,307 |
| Sea urchins | 82,400 | 440 | | | | | | | | | 82,400 | 440 |
| Irish moss | | | | | 182,400 | 16,193 | | | | | 182,400 | 16,193 |
| Kelp | | | | | 120,000 | 720 | | | | | 120,000 | 720 |
| Bloodworms | 236,600 | 35,701 | | | 27,400 | 6,571 | | | | | 264,000 | 42,272 |
| Sandworms | 116,800 | 16,461 | | | 209,900 | 38,860 | | | | | 326,700 | 55,321 |
| Starfish | | | | | | | 12,000 | 840 | | | 12,000 | 840 |
| Total | 17,600,700 | 1,908,922 | 629,800 | $93,111 | 20,251,900 | $2,198,727 | 9,425,100 | 1,098,924 | 7,789,800 | 1,113,836 | 55,697,300 | 6,413,520 |
| Grand total | 101,179,300 | 2,806,007 | 663,800 | 96,041 | 534,110,400 | 14,197,459 | 18,847,400 | 1,397,964 | 16,063,400 | 1,439,817 | 670,864,300 | 19,937,288 |

[3] Statistics on oysters used in this table are based on yields of 6.57 pounds of meats per bushel in Massachusetts; 7.05 pounds in Rhode Island; and 7.7 pounds in Connecticut.

NOTE.—The above includes the catch made by New England craft in the southern trawl fishery..

## SUPPLEMENTARY TABLE SHOWING THE PRODUCTION OF CERTAIN SHELLFISH IN NUMBER AND BUSHELS

| Product | Maine | | New Hampshire | | Massachusetts | | Rhode Island | | Connecticut | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Crabs: | | | | | | | | | | | | |
| Hard number | 2,024,204 | $16,723 | | | 6,262,800 | $40,283 | 997,200 | $9,973 | 18,480 | $424 | 9,302,684 | $67,403 |
| Soft and peelers do | | | | | | | 1,600 | 150 | 800 | 67 | 2,400 | 217 |
| Rock do | | | | | | | 16,000 | 80 | | | 16,000 | 80 |
| Clams: | | | | | | | | | | | | |
| Hard, public bushels | 1,200 | 960 | | | 118,120 | 109,332 | 184,533 | 280,073 | 16,724 | 42,768 | 320,577 | 433,133 |
| Hard, private do | | | | | 908 | 726 | 5,575 | 8,205 | 66 | 150 | 6,549 | 9,081 |
| Razor do | | | | | 24,023 | 18,888 | | | | | 24,023 | 18,888 |
| Soft, public do | 561,000 | 364,700 | 31,600 | $55,600 | 389,689 | 491,327 | 8,520 | 11,693 | 2,560 | 6,754 | 993,369 | 930,074 |
| Soft, private do | | | | | 3,710 | 4,375 | | | | | 3,710 | 4,375 |
| Surf or skimmer do | | | | | 100 | 100 | 667 | 670 | | | 767 | 770 |
| Conchs do | | | | | | | | | 972 | 815 | 972 | 815 |
| Mussels, sea do | 900 | 275 | | | | | 385 | 479 | | | 1,285 | 754 |
| Oysters, market: | | | | | | | | | | | | |
| Public, spring do | | | | | 3,562 | 8,225 | 5,277 | 4,840 | 1,052 | 966 | 9,891 | 14,031 |
| Public, fall do | | | | | | | 9,858 | 9,557 | 6,312 | 5,637 | 16,170 | 15,194 |
| Private, spring do | | | | | 28,052 | 67,778 | 261,220 | 232,723 | 428,052 | 403,418 | 717,324 | 703,919 |
| Private, fall do | | | | | | | 337,858 | 323,768 | 457,766 | 493,111 | 795,624 | 816,879 |
| Periwinkles and cockles do | 133 | 200 | | | 528 | 582 | 3,356 | 1,632 | | | 4,017 | 2,414 |
| Scallops: | | | | | | | | | | | | |
| Bay do | 11,900 | 10,276 | | | 212,866 | 255,617 | 16,058 | 19,359 | 14,452 | 18,250 | 255,276 | 303,502 |
| Sea do | 113,233 | 75,655 | | | 829,483 | 553,496 | 450 | 236 | | | 943,166 | 629,387 |

## *Fisheries of the New England States, 1937*—Continued

### SEED OYSTER FISHERY

| Item | Rhode Island | | Connecticut | | Total | |
|---|---|---|---|---|---|---|
| OPERATING UNITS | | | | | | |
| Fishermen: | *Number* | | *Number* | | *Number* | |
| On vessels | 4 | | 185 | | 189 | |
| On boats and shore: | | | | | | |
| Regular | 2 | | 160 | | 162 | |
| Casual | 2 | | 69 | | 71 | |
| Total | 8 | | 414 | | 422 | |
| Vessels: | | | | | | |
| Steam | | | 3 | | 3 | |
| Net tonnage | | | 279 | | 279 | |
| Motor | 1 | | 19 | | 20 | |
| Net tonnage | 19 | | 442 | | 461 | |
| Sail | | | 23 | | 23 | |
| Net tonnage | | | 169 | | 169 | |
| Total vessels | 1 | | 45 | | 46 | |
| Total net tonnage | 19 | | 890 | | 909 | |
| Boats: | | | | | | |
| Motor | 2 | | 1 | | 3 | |
| Other | 2 | | 109 | | 111 | |
| Apparatus: | | | | | | |
| Dredges | 2 | | 191 | | 193 | |
| Yards at mouth | 3 | | 169 | | 172 | |
| Tongs | 4 | | 93 | | 97 | |
| Rakes | | | 11 | | 11 | |
| CATCH | | | | | | |
| Oyster, seed: | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* |
| Public, spring | 12,000 | $12,000 | 50,945 | $35,685 | 62,945 | $47,685 |
| Public, fall | 915 | 549 | 42,172 | 29,307 | 43,087 | 29,856 |
| Private, spring | | | 284,800 | 278,700 | 284,800 | 278,700 |
| Private, fall | | | 63,727 | 60,492 | 63,727 | 60,492 |
| Total | 12,915 | 12,549 | 441,644 | 404,184 | 454,559 | 416,733 |

NOTE.—Of the total number of person fishing for seed oysters 225 are duplicated among those fishing for market oysters or other species. Similarly the following craft and gear are duplicated: 8 vessels, 3 motorboats, 55 other boats, 16 dredges, and 4 tongs.

## *Industries related to the fisheries of the New England States, 1937*

### OPERATING UNITS, SALARIES, AND WAGES

| Item | Maine and New Hampshire | Massachusetts | Connecticut | Rhode Island | Total |
|---|---|---|---|---|---|
| Transporting: | | | | | |
| Persons engaged: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 130 | 35 | 19 | 18 | 202 |
| On boats | 5 | 27 | | | 32 |
| Total | 135 | 62 | 19 | 18 | 234 |
| Vessels, motor | 65 | 8 | 9 | 5 | 87 |
| Net tonnage | 729 | 205 | 311 | 49 | 1,294 |
| Boats | 3 | 15 | | | 18 |
| Wholesale and manufacturing: | | | | | |
| Establishments | 146 | 193 | 34 | 27 | 400 |
| Persons engaged: | | | | | |
| Proprietors | 125 | 155 | 29 | 23 | 332 |
| Salaried employees | 177 | 554 | 40 | 31 | 802 |
| Wage earners: | | | | | |
| Average for season | 5,901 | 4,312 | 482 | 293 | 10,988 |
| Average for year | 2,425 | 3,750 | 186 | 198 | 6,559 |
| Paid to salaried employees | $269,336 | $1,428,009 | $115,921 | $68,779 | $1,882,045 |
| Paid to wage earners | $1,391,704 | $4,053,018 | $200,122 | $178,590 | $5,823,434 |
| Total salaries and wages | $1,661,040 | $5,481,027 | $316,043 | $247,369 | $7,705,479 |
| Fishermen manufacturing | 942 | 2,219 | 9 | 246 | 3,416 |

*Industries related to the fisheries of the New England States, 1937*—Continued

PRODUCTS MANUFACTURED

| Item | Maine [1] | | Massachusetts | | Rhode Island | | Connecticut | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments: | | | | | | | | |
| Alewives, salted, round ... pounds | 1,450,900 | $40,728 | | | | | | |
| Cod: | | | | | | | | |
| Fresh fillets ... do | 169,309 | 18,874 | 6,777,546 | $751,001 | | | | |
| Fresh sticks ... do | 251,060 | 25,469 | | | | | | |
| Frozen fillets ... do | (2) | (2) | 10,920,784 | 920,238 | | | | |
| Salted: | | | | | | | | |
| Green [3] ... do | 1,034,300 | 44,832 | | | | | | |
| Dry ... do | 41,500 | 2,760 | 3,207,750 | 216,935 | | | | |
| Boneless, including absolutely boneless ... do | 245,021 | 32,296 | 7,475,566 | 1,313,272 | | | | |
| Smoked fillets ... do | 108,111 | 13,866 | 685,591 | 90,631 | | | | |
| Oil, cod ... gallons | 4,089 | 1,553 | (2) | (2) | | | | |
| Oil, cod liver ... do | 16,359 | 10,566 | 257,625 | 153,824 | | | | |
| Cusk: | | | | | | | | |
| Fresh fillets ... pounds | 68,928 | 7,875 | 850,340 | 96,897 | | | | |
| Fresh sticks ... do | 487,319 | 54,670 | | | | | | |
| Frozen fillets ... do | (2) | (2) | 160,434 | 13,645 | | | | |
| Salted, green [3] ... do | 16,800 | 725 | (2) | (2) | | | | |
| Smoked fillets ... do | 71,700 | 8,430 | 442,163 | 57,683 | | | | |
| Flounders: | | | | | | | | |
| Fresh fillets ... do | 50,152 | 6,648 | 1,841,986 | 262,889 | | | | |
| Frozen fillets ... do | 50,130 | 6,015 | 1,339,714 | 221,996 | | | | |
| Haddock: | | | | | | | | |
| Fresh fillets ... do | 115,504 | 19,831 | 14,193,636 | 1,686,982 | | | | |
| Fresh sticks ... do | 34,472 | 6,105 | | | | | | |
| Frozen fillets ... do | (2) | (2) | 22,686,862 | 2,063,746 | | | | |
| Finnan haddie ... do | 200,900 | 25,275 | 553,769 | 63,796 | | | | |
| Hake: | | | | | | | | |
| Fresh fillets ... do | 179,568 | 18,457 | 1,590,364 | 153,353 | | | | |
| Fresh sticks ... do | 457,799 | 49,772 | | | | | | |
| Frozen fillets ... do | (2) | (2) | 431,285 | 28,407 | | | | |
| Salted: | | | | | | | | |
| Green [3] ... do | 1,198,275 | 38,915 | | | | | | |
| Dry ... do | | | 1,664,816 | 76,704 | | | | |
| Boneless ... do | 202,800 | 15,266 | (2) | (2) | | | | |

See footnotes at end of table.

*Industries related to the fisheries of the New England States, 1937*—Continued

PRODUCTS MANUFACTURED—Continued

| Item | Maine | | Massachusetts | | Rhode Island | | Connecticut | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments—Continued. | | | | | | | | |
| Herring, sea: | | | | | | | | |
| Salted: | | | | | | | | |
| Split ... pounds | 232,800 | $7,084 | | | | | | |
| Unclassified ... do | 97,600 | 2,835 | 1,005,042 | $61,972 | | | | |
| Pickled in vinegar ... do | 300,400 | 11,554 | (2) | (2) | | | | |
| Smoked: | | | | | | | | |
| Bloaters: | | | | | | | | |
| Hard ... do | 146,220 | 5,635 | (2) | (2) | | | | |
| Soft ... do | 21,768 | 1,136 | | | | | | |
| Boneless ... do | 2,095,272 | 204,697 | | | | | | |
| Lengthwise ... do | 84,845 | 4,725 | | | | | | |
| Medium scaled ... do | 262,612 | 16,904 | | | | | | |
| Kippered ... do | | | 80,972 | 12,289 | | | | |
| Canned "sardines" ... standard cases | 1,680,241 | 4,998,373 | | | | | | |
| Dry scrap and meal ... tons | 3,096 | 91,735 | | | | | | |
| Oil ... gallons | 53,853 | 9,207 | | | | | | |
| Mackerel: | | | | | | | | |
| Fresh fillets ... pounds | | | 227,640 | 29,386 | | | | |
| Frozen fillets ... do | | | 111,365 | 18,407 | | | | |
| Salted: | | | | | | | | |
| Fillets ... do | | | 678,876 | 77,714 | | | | |
| Split ... do | | | 1,120,051 | 113,049 | | | | |
| Pollock: | | | | | | | | |
| Fresh fillets ... do | 114,495 | 8,741 | 1,364,957 | 111,201 | | | | |
| Fresh sticks ... do | 68,520 | 6,031 | | | | | | |
| Frozen fillets ... do | 375,066 | 20,007 | 11,241,927 | 690,594 | | | | |
| Salted: | | | | | | | | |
| Green [3] ... do | 432,305 | 10,812 | | | | | | |
| Dry ... do | 71,000 | 2,405 | (2) | (2) | | | | |
| Rosefish: | | | | | | | | |
| Fresh fillets ... do | (2) | (2) | 671,112 | 73,725 | | | | |
| Frozen fillets ... do | (2) | (2) | 14,792,908 | 1,415,418 | | | | |
| Whiting: | | | | | | | | |
| Fresh fillets ... do | | | 458,828 | 32,188 | | | | |
| Frozen fillets ... do | | | 922,065 | 49,710 | | | | |
| Wolffish, frozen fillets ... do | | | 69,545 | 6,172 | | | | |
| Crab meat, packaged, fresh-cooked ... do | 116,350 | 49,158 | 182,078 | 68,571 | | | | |
| Lobster meat, packaged, fresh-cooked ... do | (2) | (2) | 147,085 | 156,040 | | | | |
| Clams, hard, fresh-shucked ... gallons | | | (2) | (2) | 3,710 | $5,857 | | |
| Clams, soft: | | | | | | | | |
| Fresh-shucked ... do | [4] 123,760 | [4] 137,602 | 343,171 | 459,629 | 104,000 | 11,140 | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Canned: | | | | | | | | | |
| Whole | standard cases | 131, 897 | 487, 286 | | | | | | |
| Chowder | do | 68, 439 | 210, 796 | (2) | (2) | | | | |
| Juice, bouillon, and cocktail | do | 14, 116 | 25, 769 | | | | | | |
| Oysters, fresh-shucked | gallons | | | | | 303, 765 | 677, 067 | 325, 578 | $628, 867 |
| Unclassified products: | | | | | | | | | |
| Fillets, fresh and frozen | pounds | 5 180, 815 | 5 19, 252 | 6 59,420 | 6 12, 639 | | | | |
| Sticks and steaks, fresh and frozen | do | | | 7 1, 227, 140 | 7 95, 737 | | | | |
| Salted | do | (8) | (8) | 9 2, 156, 970 | 9 186, 289 | | | | |
| Smoked | do | 10 62, 000 | 10 4, 770 | 11 1, 177, 987 | 11 222, 980 | (8) | (8) | (8) | (8) |
| Canned: | | | | | | | | | |
| Fish cakes, balls, etc | standard cases | 12, 476 | 70, 421 | 89, 681 | 650, 149 | | | | |
| Fish flakes | do | (12) | (12) | 13, 691 | 130, 202 | | | | |
| Cat and dog food | do | | | 41, 982 | 88, 171 | | | | |
| Other | do | 13 27, 059 | 13 229, 696 | 14 27, 164 | 14 179, 687 | (8) | (8) | | |
| Meal, groundfish | tons | (8) | (8) | 13, 928 | 388, 245 | | | | |
| Oil, miscellaneous | gallons | | | 15 42, 386 | 15 16, 397 | | | | |
| Oil, miscellaneous liver | do | | | 16 11, 318 | 16 460, 195 | | | | |
| Miscellaneous | | | 17 357, 712 | | 18 1, 131, 232 | | 19 116, 508 | | 20 46, 250 |
| Total | | | 7, 443, 271 | | 15, 109, 987 | | 810, 572 | | 675, 117 |
| By fishermen: | | | | | | | | | |
| Alewives, smoked | pounds | 171, 200 | 9, 230 | 5, 000 | 300 | | | | |
| Cod: | | | | | | | | | |
| Salted, green [3] | do | 80, 000 | 2, 800 | 252, 000 | 7, 506 | | | | |
| Salted, dry | do | 1, 600 | 83 | | | | | | |
| Cusk, salted, green [3] | do | | | 400 | 8 | | | | |
| Hake, salted, green [3] | do | | | 6, 400 | 113 | | | | |
| Herring, sea, smoked: | | | | | | | | | |
| Boneless | do | 1, 000 | 144 | | | | | | |
| Medium scaled | do | 750 | 45 | | | | | | |
| Pollock: | | | | | | | | | |
| Salted, green [3] | do | | | 2, 100 | 39 | | | | |
| Salted, dry | do | 4, 000 | 310 | | | | | | |
| Crab meat, packaged, fresh-cooked | do | 2, 730 | 956 | | | 2, 000 | 800 | | |
| Clams, hard, fresh-shucked | gallons | | | | | 1, 500 | 3, 000 | | |
| Clams, razor, fresh-shucked | do | | | 37, 467 | 15, 107 | | | | |
| Clams, soft: | | | | | | | | | |
| Fresh shucked | do | 4 75, 577 | 4 57, 971 | 25, 252 | 27, 536 | | | 15 | 23 |
| Steamed | pounds | 157, 220 | 14, 801 | | | | | | |
| Oysters, fresh-shucked | gallons | | | 4, 100 | 7, 160 | | | 2, 464 | 3, 330 |

See footnotes at end of table.

*Industries related to the fisheries of the New England States, 1937*—Continued

PRODUCTS MANUFACTURED—Continued

| Item | Maine |  | Massachusetts |  | Rhode Island |  | Connecticut |  |
|---|---|---|---|---|---|---|---|---|
|  | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By fishermen—Continued. |  |  |  |  |  |  |  |  |
| Scallops: |  |  |  |  |  |  |  |  |
| Bay, fresh-shucked ........gallons.. | ........ | ........ | 131, 706 | $391, 396 | 8, 600 | $27, 584 | 42 | $147 |
| Sea, fresh-shucked ........do.. | 33, 218 | $43, 104 | 487, 321 | 468, 160 | 20, 400 | 17, 340 | ........ | ........ |
| Total........ | ........ | 129, 444 | ........ | 917, 325 | ........ | 48, 724 | ........ | 3, 500 |
| Grand total........ | ........ | 7, 572, 715 | ........ | 16, 027, 312 | ........ | 859, 296 | ........ | 678, 617 |

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[1] A small quantity of manufactured products produced in New Hampshire have been included with those of Maine.
[2] This item has been included under "Unclassified products."
[3] This item is usually an intermediate product, and although included in the total, may be shown in its final stage of processing in this or another State.
[4] Includes the New Hampshire production.
[5] Includes fresh fillets of rosefish, and frozen fillets of cod, cusk, haddock, hake, and rosefish.
[6] Includes fresh fillets of halibut, red snapper, striped bass, and wolffish; and frozen fillets of halibut and salmon.
[7] Includes fresh steaks of cod, haddock, mackerel, halibut, pollock, salmon, and swordfish; frozen steaks of cod, halibut, wolffish, pollock, salmon, and swordfish; and fresh whiting sticks.
[8] The production of this item has been included under "Miscellaneous."
[9] Includes salted fillets of cod and hake; green-salted cusk and haddock; dry-salted pollock and haddock, salted boneless hake; and pickled and spiced alewives.
[10] Includes smoked fillets of hake, herring, and pollock.
[11] Includes smoked fillets of haddock and hake; smoked alewives, butterfish, carp, herring, and herring bloaters, lake trout, mackerel, salmon, shad, and whitefish.
[12] This item has been included under "Other canned products."
[13] Includes canned finnan haddie, alewife roe, clam cakes, fish chowder, and fish flakes.
[14] Includes canned tuna, mackerel, clam products, finnan haddie, haddock chowder, and miscellaneous canned groundfish products.
[15] Includes rosefish, blackfish, and cod oils.
[16] Includes tuna, halibut, sablefish, swordfish, and mixed liver oils.
[17] Includes fresh-cooked lobster meat; salted boneless cusk; green-salted haddock; herring scrap and meal; groundfish, clam, and miscellaneous fish meals; marine-shell buttons; pearl essence; and kelp products.
[18] Includes fresh-shucked clams and scallops; herring pickled in vinegar; miscellaneous scrap and meal; liver pressings; glue; isinglass; and marine-shell products.
[19] Includes fresh-cooked crab and lobster meat; smoked finnan haddie; canned hard clam chowder; and marine-shell products.
[20] Includes smoked butterfish, carp, chub, cisco, salmon and spoonbill cat; and poultry feed from crushed marine-shells.

NOTE.—The total value of manufactured products for the New England States was as follows: By manufacturing establishments, $24,038,947; and by fishermen, $1,098,993. Some of the above products may have been manufactured from products imported from another State or a foreign country; therefore they cannot be correlated directly with the catch within the State. Of the total number of persons engaged in the preparation of fishermen's manufactured products, 3,371 have also been included as fishermen, and 16 of the persons shown on transporting craft have also been included as fishermen. This should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## MAINE

### *Fisheries of Maine, 1937*

OPERATING UNITS: BY GEAR

| Item | Purse seines | | Haul seines | Stop seines | Gill nets | | |
|---|---|---|---|---|---|---|---|
| | Mackerel | Other | | | Anchor | Drift | Stake |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 61 | 8 | -------- | 120 | 87 | 7 | 4 |
| On boats and shore: | | | | | | | |
| Regular | 7 | 21 | 37 | 74 | 50 | 28 | 1 |
| Casual | -------- | -------- | 33 | 3 | 3 | 42 | 27 |
| Total | 68 | 29 | 70 | 197 | 140 | 77 | 32 |
| Vessels, motor: | | | | | | | |
| 5 to 10 tons | 11 | 2 | -------- | 23 | 13 | 1 | -------- |
| 11 to 20 tons | 1 | -------- | -------- | 6 | 3 | 1 | 1 |
| 21 to 30 tons | -------- | -------- | -------- | 1 | -------- | -------- | -------- |
| Total | 12 | 2 | -------- | 30 | 16 | 2 | 1 |
| Net tonnage | 98 | 16 | -------- | 263 | 148 | 23 | 12 |
| Boats: | | | | | | | |
| Motor | 2 | 7 | 28 | 22 | 21 | 26 | -------- |
| Other | 4 | 10 | 31 | 58 | -------- | 31 | 25 |
| Accessory boats | 18 | 2 | -------- | 97 | -------- | -------- | -------- |
| Apparatus: | | | | | | | |
| Number | 14 | 9 | 31 | 78 | 785 | 500 | 163 |
| Length, yards | 5,300 | 1,990 | 3,030 | -------- | -------- | -------- | -------- |
| Square yards | -------- | -------- | -------- | 35,680 | 278,631 | 112,373 | 29,238 |

| Item | Lines | | Floating traps | Weirs | Fyke nets | Dip nets | Bag nets | Otter trawls | Box traps |
|---|---|---|---|---|---|---|---|---|---|
| | Hand | Trawl | | | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 14 | 145 | -------- | -------- | -------- | -------- | -------- | 69 | -------- |
| On boats and shore: | | | | | | | | | |
| Regular | 278 | 326 | 32 | 242 | -------- | 4 | 31 | 58 | -------- |
| Casual | 872 | 58 | 3 | 78 | 5 | 57 | 54 | 2 | 17 |
| Total | 1,164 | 529 | 35 | 320 | 5 | 61 | 85 | 129 | 17 |
| Vessels, motor: | | | | | | | | | |
| 5 to 10 tons | 5 | 15 | -------- | -------- | -------- | -------- | -------- | 14 | -------- |
| 11 to 20 tons | -------- | 8 | -------- | -------- | -------- | -------- | -------- | 7 | -------- |
| 21 to 30 tons | -------- | 1 | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| 31 to 40 tons | -------- | 1 | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| 51 to 60 tons | -------- | 1 | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Total | 5 | 26 | -------- | -------- | -------- | -------- | -------- | 21 | -------- |
| Net tonnage | 30 | 340 | -------- | -------- | -------- | -------- | -------- | 208 | -------- |
| Boats: | | | | | | | | | |
| Motor | 264 | 250 | 15 | 35 | -------- | -------- | -------- | 33 | -------- |
| Other | 69 | -------- | 29 | 322 | 5 | -------- | 16 | -------- | 7 |
| Accessory boats | -------- | 62 | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Apparatus: | | | | | | | | | |
| Number | 4,921 | 15,961 | 22 | 216 | 27 | 60 | 124 | 54 | 11 |
| Yards at mouth | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 1,288 | -------- |
| Hooks, baits, or snoods | 5,520 | 858,990 | -------- | -------- | -------- | -------- | -------- | -------- | -------- |

## *Fisheries of Maine, 1937*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Pots | | | Harpoons | Spears | Dredges, scallop | Rakes, other than for oysters | Hoes | By hand, other than for oysters | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|
| | Crab | Eel | Lobster | | | | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | | |
| On vessels | | | 20 | 38 | | 33 | | | | 482 |
| On boats and shore: | | | | | | | | | | |
| Regular | 4 | 3 | 1,884 | 81 | | 105 | 3 | 622 | 8 | 2,606 |
| Casual | | 4 | 718 | 29 | 5 | 59 | | 1,482 | 6 | 3,211 |
| Total | 4 | 7 | 2,622 | 148 | 5 | 197 | 3 | 2,104 | 14 | 6,299 |
| Vessels, motor: | | | | | | | | | | |
| 5 to 10 tons | | | 18 | 3 | | 5 | | | | 86 |
| 11 to 20 tons | | | | 2 | | 1 | | | | 22 |
| 21 to 30 tons | | | | | | | | | | 2 |
| 31 to 40 tons | | | | | | 1 | | | | 2 |
| 51 to 60 tons | | | | 1 | | | | | | 1 |
| Total | | | 18 | 6 | | 7 | | | | 113 |
| Net tonnage | | | 109 | 108 | | 87 | | | | 1,115 |
| Boats: | | | | | | | | | | |
| Motor | 4 | | 1,812 | 63 | | 105 | | | | 2,083 |
| Other | | 6 | 643 | | 5 | | 3 | 862 | 10 | 1,907 |
| Accessory boats | | | | 9 | | | | | | 178 |
| Apparatus: | | | | | | | | | | |
| Number | 160 | 120 | 185,339 | 69 | 5 | 134 | 3 | 2,104 | | |
| Yards at mouth | | | | | | 194 | | | | |

CATCH: BY GEAR

| Species | Purse seines | | | | Haul seines | | Stop seines | |
|---|---|---|---|---|---|---|---|---|
| | Mackerel | | Other | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 325,600 | $1,707 | 64,200 | $411 | 600 | $25 | | |
| Herring, sea | 225,200 | 1,454 | 496,500 | 3,324 | | | 28,266,500 | $161,577 |
| Mackerel | 614,500 | 21,916 | 37,400 | 1,619 | | | | |
| Pollock | 20,000 | 150 | 892,000 | 5,619 | | | | |
| Sharks | 300 | 4 | | | | | | |
| Smelt | | | | | 112,600 | 9,697 | | |
| Total | 1,185,600 | 25,231 | 1,490,100 | 10,973 | 113,200 | 9,722 | 28,266,500 | 161,577 |

| Species | Gill nets | | | | | | Lines, hand | |
|---|---|---|---|---|---|---|---|---|
| | Anchor | | Drift | | Stake | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod | 2,532,600 | $69,639 | | | 94,400 | $2,693 | 794,200 | $12,052 |
| Cusk | 6,300 | 99 | | | | | 3,800 | 69 |
| Flounders: | | | | | | | | |
| Gray sole | 1,100 | 12 | | | | | | |
| Blackback | 2,700 | 28 | | | | | | |
| Yellowtail and dab | 2,200 | 24 | | | | | 100 | 2 |
| Unclassified | | | | | | | 1,000 | 85 |
| Haddock | 409,200 | 13,285 | | | | | 50,700 | 1,635 |
| Hake | 1,116,100 | 15,258 | | | | | 90,600 | 847 |
| Halibut | 100 | 10 | | | | | 2,900 | 413 |
| Mackerel | 300 | 24 | 123,500 | $6,079 | | | 3,800 | 104 |
| Pollock | 2,884,800 | 32,279 | | | 200,000 | 2,015 | 1,351,900 | 10,332 |
| Rosefish | 6,900 | 39 | | | | | | |
| Salmon | | | | | 400 | 80 | | |
| Sea bass | 800 | 32 | | | | | | |
| Shad | 3,300 | 166 | | | 1,000 | 112 | | |
| Sharks | 33,400 | 442 | 100 | 2 | 900 | 9 | | |
| Smelt | | | 18,500 | 1,980 | 45,500 | 5,290 | 231,700 | 28,197 |
| Sturgeon | 500 | 41 | | | | | | |
| Tautog | 100 | 4 | | | | | | |
| Whiting | 100 | 2 | 100 | 2 | | | | |
| Wolffish | 1,000 | 8 | | | | | 700 | 6 |
| Lobsters | 100 | 24 | | | | | | |
| Total | 7,001,600 | 131,416 | 142,200 | 8,063 | 342,200 | 10,199 | 2,531,400 | 53,742 |

## *Fisheries of Maine, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Lines, trawl | | Floating traps | | Weirs | | Fyke nets | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | 509,500 | $2,260 | | |
| Butterfish | | | 9,800 | $613 | | | | |
| Cod | 3,273,200 | $56,080 | | | | | | |
| Cusk | 1,539,800 | 26,610 | | | | | | |
| Eels, common | | | | | | | 300 | $23 |
| Flounders: | | | | | | | | |
| Gray sole | 1,000 | 28 | | | | | | |
| Blackback | 600 | 5 | 10,300 | 71 | | | | |
| Yellowtail and dab | 4,000 | 50 | | | | | | |
| Unclassified | 7,000 | 590 | | | | | | |
| Haddock | 1,297,500 | 43,871 | | | | | | |
| Hake | 5,651,400 | 54,565 | | | | | | |
| Halibut | 18,600 | 2,706 | | | | | | |
| Herring, sea | | | 383,300 | 2,466 | 20,580,900 | 97,556 | | |
| Mackerel | | | 690,600 | 16,933 | 73,700 | 1,928 | | |
| Pollock | 1,225,900 | 9,056 | 22,500 | 149 | 84,500 | 640 | | |
| Rosefish | 7,700 | 48 | | | | | | |
| Salmon | | | 9,400 | 2,073 | 12,900 | 3,549 | | |
| Sea bass | | | | | 100 | 14 | | |
| Shad | | | | | 5,000 | 100 | | |
| Sharks | 200 | 2 | | | | | | |
| Smelt | | | | | 28,900 | 3,218 | | |
| Sturgeon | 600 | 48 | 100 | 3 | | | | |
| Suckers | | | | | | | 30,500 | 762 |
| Tilefish | 21,000 | 840 | | | | | | |
| Tomcod | | | | | | | 2,700 | 54 |
| Wolffish | 9,300 | 78 | | | | | | |
| Yellow perch | | | | | | | 300 | 26 |
| Squid | | | 14,300 | 92 | | | | |
| Total | 13,057,800 | 194,577 | 1,140,300 | 22,400 | 21,295,500 | 109,265 | 33,800 | 865 |

| Species | Dip nets | | Bag nets | | Otter trawls | | Box traps | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 1,918,100 | $6,533 | | | | | | |
| Butterfish | | | | | 100 | $7 | | |
| Cod | | | | | 355,100 | 6,517 | | |
| Cusk | | | | | 3,000 | 47 | | |
| Eels, common | | | | | | | 40,500 | $3,708 |
| Flounders: | | | | | | | | |
| Gray sole | | | | | 956,200 | 28,432 | | |
| Yellowtail and dab | | | | | 288,900 | 4,181 | | |
| Blackback | | | | | 755,500 | 22,835 | | |
| Unclassified | | | | | 20,100 | 973 | | |
| Haddock | | | | | 1,079,300 | 37,958 | | |
| Hake | | | | | 938,300 | 9,088 | | |
| Halibut | | | | | 1,400 | 191 | | |
| Pollock | | | | | 18,200 | 123 | | |
| Rosefish | | | | | 125,700 | 886 | | |
| Salmon | 1,500 | 300 | | | | | | |
| Sharks | | | | | 100 | 1 | | |
| Smelt | 22,800 | 2,356 | 148,200 | $15,905 | | | | |
| Tomcod | 4,000 | 45 | 1,500 | 45 | | | | |
| Wolffish | | | | | 21,900 | 182 | | |
| Shrimp | | | | | 200 | 3 | | |
| Total | 1,946,400 | 9,234 | 149,700 | 15,950 | 4,564,000 | 111,424 | 40,500 | 3,708 |

| Species | Pots | | | | | | Harpoons | |
|---|---|---|---|---|---|---|---|---|
| | Crab | | Eel | | Lobster | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels, common | | | 15,500 | $1,325 | | | | |
| Swordfish | | | | | | | 72,300 | $11,379 |
| Tuna | | | | | | | 201,600 | 5,884 |
| Crabs, hard | 93,300 | $2,100 | | | 516,400 | $14,623 | | |
| Lobsters | | | | | 7,348,400 | 1,387,412 | | |
| Total | 93,300 | 2,100 | 15,500 | 1,325 | 7,864,800 | 1,402,035 | 273,900 | 17,263 |

## *Fisheries of Maine, 1937*—Continued

### CATCH: BY GEAR—Continued

| Species | Spears |  | Dredges, scallop |  | Rakes |  | Hoes |  | By hand |  |
|---|---|---|---|---|---|---|---|---|---|---|
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels, common | 3,000 | $270 |  |  |  |  |  |  |  |  |
| Clams: |  |  |  |  |  |  |  |  |  |  |
| Hard, public |  |  |  |  |  |  | 13,200 | $960 |  |  |
| Soft, public |  |  |  |  |  |  | 8,415,000 | 364,700 |  |  |
| Mussels, sea |  |  |  |  | 7,200 | $175 | 3,600 | 100 |  |  |
| Periwinkles and cockles |  |  |  |  |  |  |  |  | 2,400 | $200 |
| Scallops: |  |  |  |  |  |  |  |  |  |  |
| Bay |  |  | 71,400 | $10,276 |  |  |  |  |  |  |
| Sea |  |  | 679,400 | 75,655 |  |  |  |  |  |  |
| Sea urchins |  |  |  |  |  |  |  |  | 82,400 | 440 |
| Bloodworms |  |  |  |  |  |  | 236,600 | 35,701 |  |  |
| Sandworms |  |  |  |  |  |  | 116,800 | 16,461 |  |  |
| Total | 3,000 | 270 | 750,800 | 85,931 | 7,200 | 175 | 8,785,200 | 417,922 | 84,800 | 640 |

### OPERATING UNITS: BY COUNTIES

| Item | Cumberland | Hancock | Kennebec | Knox | Lincoln | Penobscot | Sagadohoc | Waldo | Washington | York |
|---|---|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 239 | 36 |  | 91 | 67 |  | 6 |  | 28 | 15 |
| On boats and shore: |  |  |  |  |  |  |  |  |  |  |
| Regular | 407 | 605 |  | 431 | 312 |  | 73 | 42 | 569 | 167 |
| Casual | 314 | 953 | 2 | 325 | 440 | 12 | 262 | 61 | 743 | 99 |
| Total | 960 | 1,594 | 2 | 847 | 819 | 12 | 341 | 103 | 1,340 | 281 |
| Vessels, motor: |  |  |  |  |  |  |  |  |  |  |
| 5 to 10 tons | 26 | 11 |  | 26 | 12 |  | 2 |  | 6 | 3 |
| 11 to 20 tons | 11 | 2 |  | 4 | 4 |  |  |  | 1 |  |
| 21 to 30 tons | 2 |  |  |  |  |  |  |  |  |  |
| 31 to 40 tons | 1 |  |  | 1 |  |  |  |  |  |  |
| 51 to 60 tons | 1 |  |  |  |  |  |  |  |  |  |
| Total | 41 | 13 |  | 31 | 16 |  | 2 |  | 7 | 3 |
| Net tonnage | 515 | 110 |  | 259 | 138 |  | 15 |  | 55 | 23 |
| Boats: |  |  |  |  |  |  |  |  |  |  |
| Motor | 330 | 489 |  | 450 | 268 |  | 55 | 9 | 309 | 173 |
| Other | 229 | 404 | 2 | 187 | 281 | 12 | 57 | 51 | 631 | 53 |
| Accessory boats | 96 | 8 |  | 24 | 24 |  | 4 |  | 19 | 3 |
| Apparatus: |  |  |  |  |  |  |  |  |  |  |
| Purse seines: |  |  |  |  |  |  |  |  |  |  |
| Mackerel | 1 |  |  | 2 | 8 |  |  |  |  | 3 |
| Length, yards | 350 |  |  | 610 | 3,520 |  |  |  |  | 820 |
| Other |  | 1 |  | 2 | 5 |  |  |  | 1 |  |
| Length, yards |  | 250 |  | 280 | 1,360 |  |  |  | 100 |  |
| Haul seines | 29 | 1 |  | 1 |  |  |  |  |  |  |
| Length, yards | 2,900 | 30 |  | 100 |  |  |  |  |  |  |
| Stop seines | 13 | 26 |  | 9 | 15 |  | 2 |  | 13 |  |
| Length, yards | 11,650 | 6,080 |  | 2,900 | 7,130 |  | 1,100 |  | 6,820 |  |
| Gill nets: |  |  |  |  |  |  |  |  |  |  |
| Anchor | 460 | 28 |  |  | 287 |  |  |  | 10 |  |
| Square yards | 208,004 | 15,232 |  |  | 54,060 |  |  |  | 1,335 |  |
| Drift | 228 | 22 |  | 6 |  |  |  |  | 143 | 101 |
| Square yards | 64,128 | 1,465 |  | 1,080 |  |  |  |  | 18,180 | 27,520 |
| Stake |  |  |  |  | 36 | 50 |  | 9 | 68 |  |
| Square yards |  |  |  |  | 14,158 | 3,840 |  | 540 | 10,700 |  |
| Lines: |  |  |  |  |  |  |  |  |  |  |
| Hand | 73 | 2,166 |  | 186 | 1,065 |  | 1,288 |  | 143 |  |
| Hooks | 142 | 2,247 |  | 372 | 1,127 |  | 1,351 |  | 281 |  |
| Trawl | 5,662 | 3,207 |  | 2,070 | 1,691 |  | 1,270 |  | 1,871 | 190 |
| Hooks | 299,000 | 204,620 |  | 103,500 | 86,950 |  | 66,750 |  | 88,670 | 9,500 |
| Floating traps | 5 | 1 |  |  | 4 |  | 7 | 5 |  |  |
| Weirs |  | 83 |  | 19 | 3 |  |  | 16 | 95 |  |
| Fyke nets |  |  | 18 |  |  |  | 9 |  |  |  |
| Dip nets |  | 5 |  | 15 | 5 |  | 2 |  | 32 | 1 |

*Fisheries of Maine, 1937*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Cumberland | Hancock | Kennebec | Knox | Lincoln | Penobscot | Sagadahoc | Waldo | Washington | York |
|---|---|---|---|---|---|---|---|---|---|---|
| Apparatus—Con. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Bag nets | | 12 | | | | | | 55 | 57 | |
| Otter trawls | 13 | 22 | | 11 | 7 | | | | 1 | |
| Yards at mouth | 291 | 553 | | 267 | 154 | | | | 23 | |
| Box traps | | 2 | | 3 | | | | | 6 | |
| Pots: | | | | | | | | | | |
| Crab | 160 | | | | | | | | | |
| Eel | | | | | 60 | | | 50 | | 10 |
| Lobster | 25,387 | 42,339 | | 40,597 | 29,234 | | 4,602 | 470 | 29,117 | 13,593 |
| Harpoons | 43 | | | | 10 | | 16 | | | |
| Spears | | | | 3 | 2 | | | | | |
| Dredges, scallop | 30 | 81 | | 14 | | | | | 9 | |
| Yards at mouth | 44 | 104 | | 32 | | | | | 14 | |
| Rakes, other than for oysters | 3 | | | | | | | | | |
| Hoes | 376 | 493 | | 170 | 204 | | 30 | 42 | 739 | 50 |

CATCH: BY COUNTIES

| Species | Cumberland | | Hancock | | Kennebec | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 10,600 | $132 | 548,200 | $2,271 | | |
| Butterfish | 3,700 | 225 | | | | |
| Cod | 3,217,400 | 86,194 | 1,101,600 | 14,216 | | |
| Cusk | 1,031,600 | 20,334 | 38,500 | 513 | | |
| Eels, common | | | 6,000 | 540 | 200 | $18 |
| Flounders: | | | | | | |
| Gray sole | 326,000 | 10,498 | 134,000 | 2,621 | | |
| Yellowtail and dab | 125,100 | 1,678 | | | | |
| Blackback | 32,400 | 893 | 572,400 | 18,661 | | |
| Unclassified | 2,800 | 138 | | | | |
| Haddock | 1,016,000 | 37,692 | 732,800 | 22,623 | | |
| Hake | 3,330,400 | 44,732 | 1,963,500 | 11,464 | | |
| Halibut | 7,600 | 1,125 | 5,100 | 712 | | |
| Herring, sea | 11,515,900 | 73,596 | 10,053,600 | 49,013 | | |
| Mackerel | 386,200 | 14,064 | 7,800 | 270 | | |
| Pollock | 3,212,500 | 35,067 | 972,000 | 7,092 | | |
| Rosefish | 81,700 | 507 | | | | |
| Salmon | 800 | 173 | 7,800 | 2,250 | | |
| Sea bass | 800 | 32 | | | | |
| Shad | 3,300 | 166 | | | | |
| Sharks | 33,800 | 447 | | | | |
| Smelt | 98,100 | 8,371 | 141,700 | 14,266 | | |
| turgeon | 1,200 | 92 | | | | |
| uckers | | | | | 20,000 | 500 |
| Swordfish | 72,300 | 11,379 | | | | |
| Tautog | 100 | 4 | | | | |
| Tilefish | 21,000 | 840 | | | | |
| Tomcod | | | | | 2,200 | 44 |
| Tuna | 62,800 | 1,671 | | | | |
| Whiting | 200 | 4 | | | | |
| Wolffish | 25,300 | 204 | | | | |
| Yellow perch | | | | | 200 | 16 |
| Crabs, hard | 426,700 | 11,960 | | | | |
| Lobsters | 1,119,700 | 219,342 | 1,641,000 | 319,839 | | |
| Shrimp | 200 | 3 | | | | |
| Clams: | | | | | | |
| Hard, public | 13,200 | 960 | | | | |
| Soft, public | 1,708,400 | 105,702 | 927,800 | 39,439 | | |
| Mussels, sea | 10,800 | 275 | | | | |
| Scallops: | | | | | | |
| Bay | | | 71,400 | 10,276 | | |
| Sea | 35,400 | 5,404 | 171,800 | 25,824 | | |
| Squid | 13,000 | 78 | | | | |
| Bloodworms | 96,700 | 14,800 | | | | |
| Sandworms | 500 | 90 | | | | |
| Total | 28,044,200 | 708,872 | 19,097,000 | 541,890 | 22,600 | 578 |

### *Fisheries of Maine, 1937*—Continued

CATCH: BY COUNTIES—Continued

| Species | Knox | | Lincoln | | Penobscot | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 460,800 | $1,533 | 689,400 | $3,219 | | |
| Cod | 868,000 | 14,102 | 691,100 | 15,429 | | |
| Cusk | 53,300 | 862 | 372,800 | 4,115 | | |
| Eels, common | 3,200 | 288 | 8,000 | 720 | | |
| Flounders: | | | | | | |
| Gray sole | 393,600 | 12,546 | 104,700 | 2,807 | | |
| Yellowtail and dab | 146,400 | 2,238 | 18,500 | 238 | | |
| Blackback | 144,700 | 3,193 | 9,300 | 121 | | |
| Haddock | 679,100 | 22,265 | 196,900 | 7,109 | | |
| Hake | 1,057,200 | 9,743 | 1,045,600 | 10,310 | | |
| Halibut | 4,500 | 674 | 1,100 | 178 | | |
| Herring, sea | 7,358,400 | 39,755 | 5,261,000 | 30,983 | | |
| Mackerel | 111,100 | 3,205 | 616,100 | 21,229 | | |
| Pollock | 1,082,500 | 6,690 | 379,700 | 3,776 | | |
| Rosefish | 15,500 | 158 | 43,100 | 308 | | |
| Salmon | | | 4,500 | 900 | | |
| Shad | | | 1,000 | 112 | | |
| Sharks | 300 | 4 | 900 | 9 | | |
| Smelt | 34,500 | 3,342 | 54,400 | 7,300 | 8,400 | $835 |
| Tuna | | | 5,000 | 150 | | |
| Wolffish | 5,200 | 52 | 1,300 | 8 | | |
| Crabs, hard | 28,000 | 620 | 128,300 | 3,650 | | |
| Lobsters | 1,878,300 | 318,341 | 1,000,900 | 182,852 | | |
| Clams, soft, public | 760,000 | 25,256 | 315,100 | 10,173 | | |
| Scallops, sea | 463,600 | 42,784 | | | | |
| Sea urchins | | | 82,400 | 440 | | |
| Bloodworms | 25,500 | 3,821 | 114,400 | 17,080 | | |
| Sandworms | 21,200 | 2,972 | 95,100 | 13,399 | | |
| Total | 15,594,900 | 514,444 | 11,240,600 | 336,615 | 8,400 | 835 |

| Species | Sagadahoc | | Waldo | | Washington | | York | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 104,000 | $600 | | | 780,000 | $2,056 | 225,000 | $1,125 |
| Butterfish | 6,200 | 395 | | | | | | |
| Cod | 152,300 | 2,938 | | | 1,005,700 | 13,844 | 13,400 | 258 |
| Cusk | 18,300 | 342 | | | 33,500 | 557 | 4,900 | 102 |
| Eels, common | 100 | 5 | 8,000 | $560 | 32,300 | 2,970 | 1,500 | 225 |
| Flounders: | | | | | | | | |
| Yellowtail and dab | | | | | 5,000 | 100 | 200 | 3 |
| Blackback | 10,300 | 71 | | | | | | |
| Unclassified | | | | | 25,300 | 1,510 | | |
| Haddock | 23,800 | 770 | | | 175,600 | 5,677 | 12,500 | 613 |
| Hake | 162,700 | 1,542 | | | 221,700 | 1,735 | 15,300 | 232 |
| Halibut | 800 | 103 | | | 3,800 | 514 | 100 | 14 |
| Herring, sea | 645,500 | 3,229 | 780,000 | 3,400 | 14,338,000 | 66,401 | | |
| Mackerel | 335,100 | 7,812 | | | 6,000 | 208 | 81,500 | 1,815 |
| Pollock | 103,100 | 789 | | | 948,300 | 6,928 | 1,700 | 21 |
| Salmon | 2,400 | 580 | 5,600 | 1,469 | 3,100 | 630 | | |
| Sea bass | | | | | 100 | 14 | | |
| Shad | | | | | 5,000 | 100 | | |
| Smelt | 68,500 | 10,005 | 87,200 | 8,770 | 114,600 | 13,654 | 800 | 100 |
| Suckers | 10,500 | 262 | | | | | | |
| Tomcod | 500 | 10 | 1,500 | 45 | 4,000 | 45 | | |
| Tuna | 133,800 | 4,063 | | | | | | |
| Wolffish | 900 | 8 | | | 200 | 2 | | |
| Yellow perch | 100 | 10 | | | | | | |
| Crabs, hard | 26,700 | 493 | | | | | | |
| Lobsters | 221,900 | 40,562 | 12,200 | 2,787 | 756,100 | 150,887 | 718,400 | 152,826 |
| Clams, soft, public | 189,000 | 8,640 | 63,000 | 8,200 | 4,075,700 | 143,000 | 376,000 | 24,290 |
| Periwinkles and cockles | | | | | 2,400 | 200 | | |
| Scallops, sea | | | | | 8,600 | 1,643 | | |
| Squid | 1,300 | 14 | | | | | | |
| Total | 2,217,800 | 83,243 | 957,500 | 25,231 | 22,545,000 | 412,675 | 1,451,300 | 181,624 |

## NEW HAMPSHIRE

### *Fisheries of New Hampshire, 1937* [1]

OPERATING UNITS: BY GEAR

| Item | Lines | | Bag nets | Pots, lobster | Hoes | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| | Hand | Trawl | | | | |
| Fishermen, on boats and shore: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Regular | | 1 | | 34 | 95 | 119 |
| Casual | 125 | 1 | 20 | 45 | 10 | 53 |
| Total | 125 | 2 | 20 | 79 | 105 | 172 |
| Boats: | | | | | | |
| Motor | | 2 | | 45 | | 45 |
| Other | | | | 32 | 36 | 64 |
| Apparatus: | | | | | | |
| Number | 750 | 50 | 31 | 3,459 | 105 | |
| Hooks | 750 | 2,500 | | | | |

CATCH: BY GEAR

| Species | Lines | | | | Bag nets | | Pots | | Hoes | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Hand | | Trawl | | | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod | | | 1,000 | $30 | | | | | | |
| Cusk | | | 1,000 | 30 | | | | | | |
| Haddock | | | 2,000 | 80 | | | | | | |
| Hake | | | 2,000 | 40 | | | | | | |
| Smelt | 20,000 | $2,000 | | | 8,000 | $750 | | | | |
| Lobsters | | | | | | | 155,800 | $37,511 | | |
| Clams, soft, public | | | | | | | | | 474,000 | $55,600 |
| Total | 20,000 | 2,000 | 6,000 | 180 | 8,000 | 750 | 155,800 | 37,511 | 474,000 | 55,600 |

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[1] The commercial fisheries of New Hampshire are confined to Rockingham County.

## MASSACHUSETTS

### *Fisheries of Massachusetts, 1937*

OPERATING UNITS: BY GEAR

| Item | Purse seines | | Haul seines | Gill nets | | Lines | | Pound nets |
|---|---|---|---|---|---|---|---|---|
| | Mackerel | Other | | Anchor | Drift | Hand | Trawl | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 778 | 26 | | 178 | 226 | 12 | 733 | |
| On boats and shore: | | | | | | | | |
| Regular | 44 | | 28 | 65 | 68 | 175 | 434 | 149 |
| Casual | | | 7 | 2 | 6 | 96 | 4 | 1 |
| Total | 822 | 26 | 35 | 245 | 300 | 283 | 1,171 | 150 |
| Vessels, motor: | | | | | | | | |
| 5 to 10 tons | 3 | | | 3 | 4 | 2 | 3 | |
| 11 to 20 tons | 22 | | | 8 | 17 | 2 | 21 | |
| 21 to 30 tons | 9 | | | 10 | 6 | | 2 | |
| 31 to 40 tons | 8 | 1 | | 1 | 1 | | 2 | |
| 41 to 50 tons | 11 | 1 | | 2 | 1 | | 4 | |
| 51 to 60 tons | 7 | | | | 1 | | 3 | |
| 61 to 70 tons | 7 | | | | | | 9 | |
| 71 to 80 tons | 1 | | | | | | 7 | |
| 91 to 100 tons | | | | | | | 2 | |
| 121 to 130 tons | | | | | | | 1 | |
| Total | 68 | 2 | | 24 | 30 | 4 | 54 | |
| Net tonnage | 2,231 | 80 | | 499 | 556 | 40 | 2,206 | |

## *Fisheries of Massachusetts, 1937*—Continued

### OPERATING UNITS: BY GEAR—Continued

| Item | Purse seines | | Haul seines | Gill nets | | Lines | | Pound nets |
|---|---|---|---|---|---|---|---|---|
| | Mackerel | Other | | Anchor | Drift | Hand | Trawl | |
| Boats: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Motor | 9 | | 4 | 27 | 28 | 137 | 126 | 47 |
| Other | 9 | | 10 | 4 | | 55 | 31 | 59 |
| Accessory boats | 68 | 2 | | | | | 337 | |
| Apparatus: | | | | | | | | |
| Number | 77 | 2 | 14 | 1,475 | 3,599 | 402 | 29,020 | 87 |
| Length, yards | 36,002 | 1,000 | 488 | | | | | |
| Square yards | | | | 511,536 | 1,085,581 | | | |
| Hooks, baits, or snoods | | | | | | 1,061 | 1,583,818 | |

| Item | Floating traps | Weirs | Fyke nets | Dip nets | Push nets | Otter trawls | Pots | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Crab | Eel |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | 22 | | 2,865 | | |
| On boats and shore: | | | | | | | | |
| Regular | 104 | 5 | 7 | 164 | | 105 | 89 | 25 |
| Casual | 6 | 2 | 9 | 108 | 117 | 3 | 14 | 12 |
| Total | 110 | 7 | 16 | 294 | 117 | 2,973 | 103 | 37 |
| Vessels: | | | | | | | | |
| Steam: | | | | | | | | |
| 91 to 100 tons | | | | | | 7 | | |
| 111 to 120 tons | | | | | | 2 | | |
| 131 to 140 tons | | | | | | 1 | | |
| 161 to 170 tons | | | | | | 2 | | |
| 171 to 180 tons | | | | | | 1 | | |
| 181 to 190 tons | | | | | | 2 | | |
| 201 to 210 tons | | | | | | 10 | | |
| 211 to 220 tons | | | | | | 2 | | |
| 241 to 250 tons | | | | | | 1 | | |
| 261 to 270 tons | | | | | | 1 | | |
| Total | | | | | | 29 | | |
| Net tonnage | | | | | | 4,942 | | |
| Motor: | | | | | | | | |
| 5 to 10 tons | | | | | | 32 | | |
| 11 to 20 tons | | | | 3 | | 87 | | |
| 21 to 30 tons | | | | | | 25 | | |
| 31 to 40 tons | | | | 1 | | 22 | | |
| 41 to 50 tons | | | | | | 22 | | |
| 51 to 60 tons | | | | | | 21 | | |
| 61 to 70 tons | | | | | | 13 | | |
| 71 to 80 tons | | | | | | 7 | | |
| 81 to 90 tons | | | | | | 8 | | |
| 91 to 100 tons | | | | | | 3 | | |
| 101 to 110 tons | | | | | | 5 | | |
| 111 to 120 tons | | | | | | 12 | | |
| 121 to 130 tons | | | | | | 4 | | |
| 141 to 150 tons | | | | | | 4 | | |
| 151 to 160 tons | | | | | | 1 | | |
| 161 to 170 tons | | | | | | 3 | | |
| 171 to 180 tons | | | | | | 3 | | |
| 181 to 190 tons | | | | | | 1 | | |
| Total | | | | 4 | | 273 | | |
| Net tonnage | | | | 83 | | 11,760 | | |
| Total vessels | | | | 4 | | 302 | | |
| Total net tonnage | | | | 83 | | 16,702 | | |
| Boats: | | | | | | | | |
| Motor | 33 | | 2 | 68 | | 44 | 75 | 16 |
| Other | 51 | | 10 | 105 | 112 | | 3 | 20 |
| Apparatus: | | | | | | | | |
| Number | 50 | 4 | 18 | 203 | 117 | 346 | 3,470 | 1,105 |
| Yards at mouth | | | | | | 10,399 | | |

### *Fisheries of Massachusetts, 1937*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Pots—Continued | | Harpoons | Spears | Dredges | | |
|---|---|---|---|---|---|---|---|
| | Lobster | Periwinkle and cockle | | | Clam | Oyster | Scallop |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 2 | | 549 | | 24 | 4 | 273 |
| On boats and shore: | | | | | | | |
| Regular | 1,036 | 4 | 44 | 10 | 91 | 35 | 840 |
| Casual | 61 | 1 | | 12 | 9 | | 825 |
| Total | 1,099 | 5 | 593 | 22 | 124 | 39 | 1,938 |
| Vessels, motor: | | | | | | | |
| 5 to 10 tons | 1 | | 7 | | 2 | | 4 |
| 11 to 20 tons | | | 19 | | 4 | 1 | 17 |
| 21 to 30 tons | | | 6 | | | | 7 |
| 31 to 40 tons | | | 3 | | | | 5 |
| 41 to 50 tons | | | 7 | | | | 1 |
| 51 to 60 tons | | | 8 | | | | 2 |
| 61 to 70 tons | | | 6 | | | | |
| 71 to 80 tons | | | 6 | | | | |
| 91 to 100 tons | | | 1 | | | | |
| Total | 1 | | 63 | | 6 | 1 | 36 |
| Net tonnage | 5 | | 2,335 | | 69 | 12 | 782 |
| Boats: | | | | | | | |
| Motor | 795 | 1 | 11 | | 64 | 18 | 640 |
| Other | 86 | 4 | | 14 | | | 196 |
| Accessory boats | | | 68 | | | | |
| Apparatus: | | | | | | | |
| Number | 72,290 | 80 | 74 | 22 | 94 | 35 | 2,857 |
| Yards at mouth | | | | | 39 | 35 | 2,455 |

| Item | Tongs | | Rakes, other than for oysters | Forks | Hoes | By hand, other than for oysters | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|
| | Oyster | Other | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | | | | 4,258 |
| On boats and shore: | | | | | | | |
| Regular | 27 | 87 | 384 | 117 | 861 | 1 | 3,614 |
| Casual | 10 | 74 | 439 | 346 | 921 | 78 | 2,609 |
| Total | 37 | 1, 61 | 823 | 463 | 1,782 | 79 | 10,481 |
| Vessels: | | | | | | | |
| Steam: | | | | | | | |
| 91 to 100 tons | | | | | | | 7 |
| 111 to 120 tons | | | | | | | 2 |
| 131 to 140 tons | | | | | | | 1 |
| 161 to 170 tons | | | | | | | 2 |
| 171 to 180 tons | | | | | | | 1 |
| 181 to 190 tons | | | | | | | 2 |
| 201 to 210 tons | | | | | | | 10 |
| 211 to 220 tons | | | | | | | 2 |
| 241 to 250 tons | | | | | | | 1 |
| 261 to 270 tons | | | | | | | 1 |
| Total | | | | | | | 29 |
| Net tonnage | | | | | | | 4,942 |
| Motor: | | | | | | | |
| 5 to 10 tons | | | | | | | 42 |
| 11 to 20 tons | | | | | | | 131 |
| 21 to 30 tons | | | | | | | 41 |
| 31 to 40 tons | | | | | | | 28 |
| 41 to 50 tons | | | | | | | 28 |
| 51 to 60 tons | | | | | | | 25 |
| 61 to 70 tons | | | | | | | 25 |
| 71 to 80 tons | | | | | | | 14 |
| 81 to 90 tons | | | | | | | 8 |
| 91 to 100 tons | | | | | | | 5 |
| 101 to 110 tons | | | | | | | 5 |
| 111 to 120 tons | | | | | | | 12 |
| 121 to 130 tons | | | | | | | 5 |

*Fisheries of Massachusetts, 1937*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Tongs | | Rakes, other than for oysters | Forks | Hoes | By hand, other than for oysters | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|
| | Oyster | Other | | | | | |
| Vessels—Continued. | | | | | | | |
| Motor—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| 141 to 150 tons | | | | | | | 4 |
| 151 to 160 tons | | | | | | | 1 |
| 161 to 170 tons | | | | | | | 3 |
| 171 to 180 tons | | | | | | | 3 |
| 181 to 190 tons | | | | | | | 1 |
| Total | | | | | | | 381 |
| Net tonnage | | | | | | | 15, 160 |
| Total vessels | | | | | | | 410 |
| Total net tonnage | | | | | | | 20, 102 |
| Boats: | | | | | | | |
| Motor | 1 | 37 | 84 | | 6 | | 1, 754 |
| Other | 31 | 87 | 618 | 97 | 415 | 2 | 1, 675 |
| Accessory boats | | | | | | | 457 |
| Apparatus, number | 37 | 138 | 823 | 463 | 1, 782 | | |

CATCH: BY GEAR

| Species | Purse seines | | | | Haul seines | |
|---|---|---|---|---|---|---|
| | Mackerel | | Other | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 72, 100 | $626 | | | 210, 100 | $1, 370 |
| Bluefish | | | | | 2, 000 | 204 |
| Butterfish | 96, 800 | 3, 686 | | | | |
| Cod | 100 | 3 | | | | |
| Flounders, blackback | | | | | 100 | 5 |
| Grayfish | 800 | 8 | | | | |
| Herring, sea | 300 | 4 | | | | |
| Launce | | | | | 264, 400 | 3, 302 |
| Mackerel | 11, 759, 400 | 537, 394 | | | | |
| Pollock | 7, 300 | 90 | | | | |
| Shad | 6, 400 | 264 | | | 2, 000 | 37 |
| Sharks | 9, 300 | 328 | | | | |
| Striped bass | 7, 000 | 556 | | | 3, 000 | 265 |
| Sturgeon | 200 | 26 | | | | |
| Tuna | 5, 000 | 201 | 132, 400 | $5, 296 | | |
| Total | 11, 964, 700 | 543, 186 | 132, 400 | 5, 296 | 481, 600 | 5, 183 |

| Species | Gill nets | | | | Lines | | | |
|---|---|---|---|---|---|---|---|---|
| | Anchor | | Drift | | Hand | | Trawl | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 19, 400 | $164 | | | 100 | $1 |
| Bluefish | 2, 000 | $400 | 100 | 7 | 31, 000 | $2, 435 | 500 | 48 |
| Butterfish | | | 10, 000 | 338 | | | 600 | 31 |
| Cod | 3, 139, 600 | 80, 339 | | | 170, 500 | 4, 187 | 16, 801, 700 | 386, 850 |
| Cunners | 27, 400 | 880 | | | | | | |
| Cusk | 51, 000 | 948 | | | | | 8, 173, 800 | 150, 849 |
| Eels, conger | | | | | | | 300 | 3 |
| Flounders: | | | | | | | | |
| Gray sole | 200 | 2 | | | | | 24, 800 | 1, 059 |
| Lemon sole | | | | | | | 2, 500 | 108 |
| Yellowtail and dab | 7, 700 | 99 | | | 1, 000 | 24 | 232, 900 | 8, 228 |
| Blackback | 1, 700 | 43 | | | 1, 100 | 61 | 129, 300 | 6, 230 |
| Fluke | 160, 000 | 6, 400 | | | | | 300 | 32 |
| Unclassified | 500 | 8 | | | | | | |
| Goosefish | 10, 300 | 108 | | | 100 | 1 | | |
| Haddock | 453, 700 | 15, 206 | | | 1, 400 | 36 | 17, 010, 000 | 509, 050 |
| Hake | 1, 134, 300 | 14, 512 | | | 1, 700 | 14 | 9, 196, 600 | 160, 620 |
| Halibut | 600 | 83 | | | 200 | 30 | 1, 882, 600 | 203, 281 |
| Herring, sea | 3, 300 | 29 | 1, 400 | 11 | | | | |
| Mackerel | 2, 100 | 69 | 1, 624, 900 | 84, 254 | 9, 600 | 434 | | |
| Pollock | 8, 605, 800 | 115, 258 | | | 208, 800 | 1, 898 | 1, 294, 400 | 21, 853 |
| Rosefish | 600 | 14 | | | | | 1, 700 | 22 |

## *Fisheries of Massachusetts, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Gill nets | | | | Lines | | | |
|---|---|---|---|---|---|---|---|---|
| | Anchor | | Drift | | Hand | | Trawl | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Scup or porgy | | | | | 27,300 | $793 | 33,100 | $597 |
| Sea bass | | | | | 7,900 | 402 | 5,500 | 373 |
| Shad | 13,700 | $884 | 3,900 | $282 | | | | |
| Sharks | 20,300 | 505 | 6,500 | 226 | | | | |
| Skates | 100 | 1 | | | | | 2,700 | 23 |
| Smelt | | | | | 1,500 | 300 | | |
| Squeteagues or "sea trout," gray | | | | | | | 100 | 9 |
| Striped bass | | | | | 35,000 | 2,750 | | |
| Sturgeon | 1,000 | 88 | 200 | 19 | | | | |
| Tautog | 500 | 16 | | | 58,900 | 2,856 | | |
| Tilefish | | | | | | | 15,000 | 600 |
| Tuna | 4,600 | 151 | 1,500 | 57 | | | | |
| Whiting | | | 400 | 5 | | | 32,500 | 377 |
| Wolffish | 400 | 3 | | | | | 335,700 | 7,943 |
| Squid | | | 100 | 1 | | | 600 | 17 |
| Total | 13,641,400 | 236,046 | 1,668,400 | 85,364 | 556,000 | 16,221 | 55,177,300 | 1,458,204 |

| Species | Pound nets | | Floating traps | | Weirs | | Fyke nets | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 31,800 | $425 | 18,500 | $187 | 232,600 | $1,883 | 500 | $5 |
| Anchovies | 200 | 4 | | | | | | |
| Bluefish | 7,100 | 582 | 1,200 | 65 | | | | |
| Bonito | 4,100 | 287 | 500 | 28 | | | | |
| Butterfish | 664,700 | 31,846 | 182,800 | 9,685 | | | | |
| Cod | 14,500 | 382 | 46,100 | 958 | | | | |
| Eels, common | 2,700 | 292 | 600 | 48 | | | 12,400 | 1,138 |
| Flounders: | | | | | | | | |
| Blackback | 600 | 24 | | | | | 1,200 | 200 |
| Fluke | 10,700 | 519 | 200 | 15 | | | 300 | 13 |
| Grayfish | 19,700 | 355 | | | | | | |
| Herring, sea | 726,700 | 7,020 | 405,700 | 3,443 | | | | |
| King whiting or "kingfish" | 100 | 11 | | | | | | |
| Launce | 4,100 | 81 | | | | | | |
| Mackerel | 5,964,800 | 207,429 | 1,748,700 | 53,184 | | | | |
| Menhaden | 39,000 | 357 | | | | | | |
| Pollock | 304,300 | 2,988 | 430,400 | 3,032 | | | | |
| Salmon | | | 4,400 | 287 | | | | |
| Scup or porgy | 98,700 | 910 | 2,800 | 52 | | | | |
| Sea bass | 9,700 | 738 | 8,600 | 286 | | | | |
| Sea robin | 12,900 | 145 | 400 | 7 | | | | |
| Shad | 7,600 | 350 | 10,600 | 270 | | | | |
| Sharks | 35,500 | 457 | 2,000 | 29 | | | | |
| Skates | 1,600 | 21 | | | | | | |
| Skipper or "billfish" | 600 | 68 | | | | | | |
| Squeteagues or "sea trout," gray | 10,600 | 669 | | | | | | |
| Striped bass | 26,300 | 2,425 | 27,900 | 1,792 | | | | |
| Sturgeon | 1,500 | 156 | 1,300 | 100 | | | | |
| Tautog | 11,900 | 436 | 11,200 | 503 | | | | |
| Tuna | 425,100 | 12,505 | 115,500 | 4,454 | | | | |
| Turbot | 100 | 3 | | | | | | |
| White perch | 1,600 | 16 | | | | | | |
| Whiting | 10,212,600 | 93,924 | 3,421,600 | 27,231 | | | | |
| Squid | 1,660,200 | 20,001 | 161,000 | 2,970 | | | | |
| Total | 20,311,600 | 385,426 | 6,602,000 | 108,626 | 232,600 | 1,883 | 14,400 | 1,356 |

*Fisheries of Massachusetts, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Dip nets | | Push nets | | Otter trawls | | Pots, crab | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 496, 600 | $3, 570 | --- | --- | 4, 200 | $52 | --- | --- |
| Bluefish | --- | --- | --- | --- | 3, 000 | 278 | --- | --- |
| Butterfish | --- | --- | --- | --- | 1, 295, 500 | 41, 821 | --- | --- |
| Carp | 1, 000 | 40 | --- | --- | --- | --- | --- | --- |
| Cod | --- | --- | --- | --- | 106, 155, 100 | 1, 999, 506 | --- | --- |
| Croaker | --- | --- | --- | --- | 866, 400 | 28, 057 | --- | --- |
| Cunners | --- | --- | --- | --- | 400 | 14 | --- | --- |
| Cusk | --- | --- | --- | --- | 393, 700 | 7, 001 | --- | --- |
| Drum, red | --- | --- | --- | --- | 2, 800 | 16 | --- | --- |
| Eels: | | | | | | | | |
| Common | --- | --- | --- | --- | 1, 300 | 130 | --- | --- |
| Conger | --- | --- | --- | --- | 45, 300 | 666 | --- | --- |
| Flounders: | | | | | | | | |
| Gray sole | --- | --- | --- | --- | 9, 960, 000 | 474, 089 | --- | --- |
| Lemon sole | --- | --- | --- | --- | 3, 266, 200 | 226, 658 | --- | --- |
| Yellowtail and dab | --- | --- | --- | --- | 16, 366, 200 | 368, 891 | --- | --- |
| Blackback | --- | --- | --- | --- | 5, 407, 000 | 211, 094 | --- | --- |
| Fluke | --- | --- | --- | --- | 1, 788, 900 | 160, 113 | --- | --- |
| Unclassified | --- | --- | --- | --- | 747, 200 | 23, 340 | --- | --- |
| Goosefish | --- | --- | --- | --- | 6, 200 | 69 | --- | --- |
| Grayfish | --- | --- | --- | --- | 7, 100 | 165 | --- | --- |
| Haddock | --- | --- | --- | --- | 149, 118, 400 | 3, 548, 675 | --- | --- |
| Hake | --- | --- | --- | --- | 6, 941, 600 | 107, 536 | --- | --- |
| Halibut | --- | --- | --- | --- | 532, 300 | 49, 752 | --- | --- |
| Herring, sea | 1, 754, 300 | 17, 448 | --- | --- | 2, 700 | 55 | --- | --- |
| Herring smelt | --- | --- | --- | --- | 10, 200 | 167 | --- | --- |
| King whiting or "kingfish" | --- | --- | --- | --- | 11, 500 | 304 | --- | --- |
| Mackerel | --- | --- | --- | --- | 56, 200 | 3, 328 | --- | --- |
| Pollock | --- | --- | --- | --- | 19, 763, 000 | 314, 648 | --- | --- |
| Rosefish | --- | --- | --- | --- | 58, 213, 300 | 886, 470 | --- | --- |
| Scup or porgy | --- | --- | --- | --- | 8, 072, 600 | 173, 590 | --- | --- |
| Sea bass | --- | --- | --- | --- | 2, 314, 200 | 123, 915 | --- | --- |
| Sea robin | --- | --- | --- | --- | 42, 400 | 677 | --- | --- |
| Shad | --- | --- | --- | --- | 4, 200 | 199 | --- | --- |
| Sharks | --- | --- | --- | --- | 15, 100 | 444 | --- | --- |
| Skates | --- | --- | --- | --- | 36, 700 | 521 | --- | --- |
| Spot | --- | --- | --- | --- | 1, 300 | 17 | --- | --- |
| Squeteagues or "sea trout," gray | --- | --- | --- | --- | 117, 500 | 5, 165 | --- | --- |
| Striped bass | --- | --- | --- | --- | 21, 400 | 1, 983 | --- | --- |
| Sturgeon | --- | --- | --- | --- | 3, 100 | 273 | --- | --- |
| Tautog | --- | --- | --- | --- | 1, 400 | 79 | --- | --- |
| Tilefish | --- | --- | --- | --- | 600 | 31 | --- | --- |
| Tuna | --- | --- | --- | --- | 100 | 4 | --- | --- |
| White perch | --- | --- | --- | --- | 600 | 13 | --- | --- |
| Whiting | --- | --- | --- | --- | 7, 370, 700 | 117, 677 | --- | --- |
| Wolffish | --- | --- | --- | --- | 2, 188, 800 | 40, 508 | --- | --- |
| Crabs, hard | --- | --- | --- | --- | --- | --- | 968, 400 | $23, 776 |
| Lobsters | --- | --- | --- | --- | 4, 400 | 368 | --- | --- |
| Shrimp | --- | --- | --- | --- | 6, 800 | 475 | --- | --- |
| Scallops: | | | | | | | | |
| Bay | 63, 500 | 21, 112 | 63, 000 | $21, 000 | 2, 000 | 900 | --- | --- |
| Sea | --- | --- | --- | --- | 7, 100 | 994 | --- | --- |
| Squid | --- | --- | --- | --- | 92, 400 | 1, 899 | --- | --- |
| Total | 2, 315, 400 | 42, 170 | 63, 000 | 21, 000 | 401, 269, 100 | 8, 922, 627 | 968, 400 | 23, 776 |

| Species | Pots—Continued | | | | | |
|---|---|---|---|---|---|---|
| | Eel | | Lobster | | Periwinkle and cockle | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels, common | 69, 900 | $6, 109 | --- | --- | --- | --- |
| Crabs, hard | --- | --- | 597, 300 | $16, 507 | --- | --- |
| Lobsters | --- | --- | 2, 130, 500 | 559, 923 | --- | --- |
| Periwinkles and cockles | --- | --- | --- | --- | 8, 600 | $507 |
| Total | 69, 900 | 6, 109 | 2, 727, 800 | 576, 430 | 8, 600 | 507 |

## *Fisheries of Massachusetts, 1937*—Continued

### CATCH: BY GEAR—Continued

| Species | Harpoons | | Spears | | Dredges | | Tongs | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels, common | | | 5,800 | $467 | | | | |
| Swordfish | 1,413,200 | $229,273 | | | | | | |
| Tuna | 800 | 32 | | | | | | |
| Clams: | | | | | | | | |
| Hard, public | | | | | 378,200 | $37,816 | 117,900 | $9,478 |
| Hard, private | | | | | | | 5,000 | 363 |
| Oysters, market: | | | | | | | | |
| Public, spring | | | | | 400 | 100 | 23,000 | 8,125 |
| Private, spring | | | | | 55,000 | 18,603 | 129,300 | 49,175 |
| Periwinkles and cockles | | | | | 900 | 75 | | |
| Scallops: | | | | | | | | |
| Bay | | | | | 1,079,000 | 185,065 | | |
| Sea | | | | | 4,969,800 | 552,502 | | |
| Total | 1,414,000 | 229,305 | 5,800 | 467 | 6,483,300 | 794,161 | 275,200 | 67,141 |

| Species | Rakes | | Forks | | Hoes | | By hand | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams: | | | | | | | | |
| Hard, public | 778,400 | $60,243 | 19,200 | $1,309 | 6,800 | $486 | | |
| Hard, private | 5,000 | 363 | | | | | | |
| Razor | | | | | 725,500 | 18,888 | | |
| Soft, public | | | 309,400 | 28,145 | 5,204,700 | 463,182 | | |
| Soft, private | | | | | 52,500 | 4,375 | | |
| Surf, or skimmer | 1,700 | 100 | | | | | | |
| Scallops, bay | 84,600 | 27,540 | | | | | | |
| Irish moss | | | | | | | 182,400 | $16,193 |
| Kelp | | | | | | | 120,000 | 720 |
| Bloodworms | | | 24,200 | 5,800 | 3,200 | 771 | | |
| Sandworms | | | 174,900 | 31,520 | 35,000 | 7,340 | | |
| Total | 869,700 | 88,246 | 527,700 | 66,774 | 6,027,700 | 495,042 | 302,400 | 16,913 |

### OPERATING UNITS: BY COUNTIES

| Item | Barnstable | Bristol | Dukes | Essex | Nantucket | Norfolk | Plymouth | Suffolk |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 132 | 358 | 58 | 1,502 | 58 | | | 2,150 |
| On boats and shore: | | | | | | | | |
| Regular | 786 | 326 | 316 | 964 | 143 | 83 | 516 | 480 |
| Casual | 587 | 532 | 317 | 368 | 30 | 155 | 336 | 284 |
| Total | 1,505 | 1,216 | 691 | 2,834 | 231 | 238 | 852 | 2,914 |
| Vessels: | | | | | | | | |
| Steam: | | | | | | | | |
| 91 to 100 tons | | | | | | | | 7 |
| 111 to 120 tons | | | | | | | | 2 |
| 131 to 140 tons | | | | | | | | 1 |
| 161 to 170 tons | | | | | | | | 2 |
| 171 to 180 tons | | | | | | | | 1 |
| 181 to 190 tons | | | | 1 | | | | 1 |
| 201 to 210 tons | | | | | | | | 10 |
| 211 to 220 tons | | | | | | | | 2 |
| 241 to 250 tons | | | | | | | | 1 |
| 261 to 270 tons | | | | | | | | 1 |
| Total | | | | 1 | | | | 28 |
| Net tonnage | | | | 184 | | | | 4,758 |

*Fisheries of Massachusetts, 1937*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Barnstable | Bristol | Dukes | Essex | Nantucket | Norfolk | Plymouth | Suffolk |
|---|---|---|---|---|---|---|---|---|
| Vessels—Continued. | | | | | | | | |
| Motor: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| 5 to 10 tons | 11 | 9 | 4 | 11 | 3 | ------- | ------- | 4 |
| 11 to 20 tons | 12 | 18 | 3 | 33 | 8 | ------- | ------- | 57 |
| 21 to 30 tons | 2 | 7 | 2 | 19 | ------- | ------- | ------- | 11 |
| 31 to 40 tons | ------- | 6 | 2 | 12 | 1 | ------- | ------- | 7 |
| 41 to 50 tons | ------- | 6 | ------- | 16 | ------- | ------- | ------- | 6 |
| 51 to 60 tons | ------- | 2 | ------- | 14 | ------- | ------- | ------- | 9 |
| 61 to 70 tons | 1 | 2 | ------- | 15 | ------- | ------- | ------- | 7 |
| 71 to 80 tons | ------- | ------- | ------- | 9 | ------- | ------- | ------- | 5 |
| 81 to 90 tons | ------- | ------- | ------- | 1 | ------- | ------- | ------- | 7 |
| 91 to 100 tons | ------- | ------- | ------- | 2 | ------- | ------- | ------- | 3 |
| 101 to 110 tons | ------- | ------- | ------- | 1 | ------- | ------- | ------- | 4 |
| 111 to 120 tons | ------- | ------- | ------- | ------- | ------- | ------- | ------- | 12 |
| 121 to 130 tons | ------- | ------- | ------- | ------- | ------- | ------- | ------- | 5 |
| 141 to 150 tons | ------- | ------- | ------- | ------- | ------- | ------- | ------- | 4 |
| 151 to 160 tons | ------- | ------- | ------- | ------- | ------- | ------- | ------- | 1 |
| 161 to 170 tons | ------- | ------- | ------- | ------- | ------- | ------- | ------- | 3 |
| 171 to 180 tons | ------- | ------- | ------- | ------- | ------- | ------- | ------- | 3 |
| 181 to 190 tons | ------- | ------- | ------- | ------- | ------- | ------- | ------- | 1 |
| Total | 26 | 50 | 11 | 133 | 12 | ------- | ------- | 149 |
| Net tonnage | 370 | 1, 228 | 201 | 4, 963 | 174 | ------- | ------- | 8, 224 |
| Total vessels | 26 | 50 | 11 | 134 | 12 | ------- | ------- | 177 |
| Total net tonnage | 370 | 1, 228 | 201 | 5, 147 | 174 | ------- | ------- | 12, 982 |
| Boats: | | | | | | | | |
| Motor | 416 | 314 | 165 | 391 | 92 | 36 | 230 | 110 |
| Other | 463 | 231 | 349 | 262 | 15 | 15 | 230 | 110 |
| Accessory boats | 17 | 21 | 4 | 260 | ------- | ------- | ------- | 155 |
| Apparatus: | | | | | | | | |
| Purse seines: | | | | | | | | |
| Mackerel | 4 | 1 | ------- | 47 | ------- | ------- | 1 | 24 |
| Length, yards | 1, 720 | 520 | ------- | 22, 442 | ------- | ------- | 300 | 11, 020 |
| Other | ------- | ------- | ------- | 2 | ------- | ------- | ------- | ------- |
| Length, yards | ------- | ------- | ------- | 1, 000 | ------- | ------- | ------- | ------- |
| Haul seines | 2 | ------- | 2 | 9 | ------- | ------- | 1 | ------- |
| Length, yards | 60 | ------- | 8 | 395 | ------- | ------- | 25 | ------- |
| Gill nets: | | | | | | | | |
| Anchor | 140 | ------- | ------- | 1, 291 | 12 | ------- | ------- | 32 |
| Square yards | 32, 000 | ------- | ------- | 460, 296 | 4, 800 | ------- | ------- | 14, 440 |
| Drift | 218 | 77 | ------- | 2, 782 | 36 | ------- | 30 | 456 |
| Square yards | 78, 720 | 22, 176 | ------- | 833, 391 | 10, 200 | ------- | 8, 300 | 132, 794 |
| Lines: | | | | | | | | |
| Hand | 57 | 185 | 32 | 94 | 28 | ------- | 2 | 4 |
| Hooks | 114 | 370 | 61 | 448 | 56 | ------- | 4 | 8 |
| Trawl | 1, 800 | 40 | 30 | 13, 231 | ------- | ------- | 220 | 13, 699 |
| Hooks | 92, 400 | 2, 000 | 1, 500 | 656, 567 | ------- | ------- | 11, 000 | 820, 351 |
| Pound nets | 70 | 7 | 7 | 3 | ------- | ------- | ------- | ------- |
| Floating traps | 11 | ------- | ------- | 39 | ------- | ------- | ------- | ------- |
| Weirs | ------- | ------- | ------- | 1 | ------- | ------- | 3 | ------- |
| Fyke nets | 16 | ------- | 2 | ------- | ------- | ------- | ------- | ------- |
| Dip nets | 102 | ------- | 54 | 29 | ------- | ------- | 9 | 9 |
| Push nets | ------- | ------- | 117 | ------- | ------- | ------- | ------- | ------- |
| Otter trawls | 41 | 47 | 10 | 80 | 17 | ------- | 2 | 149 |
| Yards at mouth | 1, 120 | 1, 365 | 271 | 2, 548 | 439 | ------- | 48 | 4, 608 |
| Pots: | | | | | | | | |
| Crab | ------- | 68 | ------- | 698 | ------- | 832 | 350 | 1, 522 |
| Eel | 59 | 131 | 415 | 140 | 360 | ------- | ------- | ------- |
| Lobster | 3, 880 | 2, 730 | 6, 595 | 26, 172 | 567 | 3, 870 | 20, 347 | 8, 129 |
| Periwinkle and cockle | ------- | 10 | ------- | 50 | 20 | ------- | ------- | ------- |
| Harpoons | 2 | 15 | 8 | 34 | ------- | ------- | ------- | 15 |
| Spears | ------- | 6 | 10 | 6 | ------- | ------- | ------- | ------- |
| Dredges: | | | | | | | | |
| Clam | 33 | 40 | 7 | ------- | 13 | ------- | 1 | ------- |
| Yards at mouth | 12 | 16 | 4 | ------- | 6 | ------- | 1 | ------- |
| Oyster | 11 | ------- | ------- | ------- | ------- | ------- | 24 | ------- |
| Yards at mouth | 11 | ------- | ------- | ------- | ------- | ------- | 24 | ------- |
| Scallop | 780 | 888 | 624 | 10 | 311 | ------- | 239 | 5 |
| Yards at mouth | 656 | 914 | 509 | 35 | 124 | ------- | 200 | 17 |
| Tongs: | | | | | | | | |
| Oyster | 31 | 6 | ------- | ------- | ------- | ------- | ------- | ------- |
| Other | 5 | 91 | ------- | ------- | 2 | ------- | 40 | ------- |
| Rakes, other than for oysters | 460 | 83 | 201 | ------- | 4 | ------- | 75 | ------- |
| Forks | ------- | ------- | 10 | 113 | ------- | ------- | ------- | 340 |
| Hoes | 457 | 46 | 17 | 555 | 19 | 185 | 503 | ------- |

## *Fisheries of Massachusetts, 1937*—Continued

### CATCH: BY COUNTIES

| Species | Barnstable | | Bristol | | Dukes | | Essex | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 33,100 | $335 | | | 61,100 | $436 | 231,900 | $2,142 |
| Anchovies | 200 | 4 | | | | | | |
| Bluefish | 10,000 | 863 | 100 | $6 | 6,300 | 449 | 2,700 | 215 |
| Bonito | 1,800 | 125 | 100 | 10 | 2,300 | 157 | 400 | 23 |
| Butterfish | 700,500 | 34,141 | 178,300 | 8,453 | 36,600 | 2,323 | 328,800 | 15,162 |
| Carp | | | | | 1,000 | 40 | | |
| Cod | 2,086,600 | 49,137 | 4,798,300 | 106,791 | 29,400 | 580 | 14,735,700 | 325,442 |
| Croaker | | | 100 | 4 | 1,500 | 36 | 752,900 | 23,671 |
| Cunners | | | | | | | 27,500 | 883 |
| Cusk | 211,500 | 3,611 | | | | | 5,210,300 | 96,721 |
| Drum, red | | | | | | | 2,800 | 16 |
| Eels: | | | | | | | | |
| Common | 19,900 | 1,688 | 22,400 | 1,152 | 40,500 | 4,603 | 6,300 | 417 |
| Conger | | | 1,700 | 36 | 1,200 | 12 | 30,900 | 462 |
| Flounders: | | | | | | | | |
| Gray sole | 226,600 | 14,101 | 1,644,300 | 118,024 | 5,000 | 230 | 1,650,900 | 77,254 |
| Lemon sole | 93,100 | 8,779 | 642,900 | 54,728 | 2,000 | 200 | 252,600 | 17,306 |
| Yellowtail and dab | 1,555,800 | 35,926 | 5,216,500 | 120,064 | 1,057,000 | 25,124 | 2,511,700 | 55,106 |
| Blackback | 868,500 | 32,992 | 1,225,200 | 49,491 | 235,000 | 8,600 | 446,100 | 18,915 |
| Fluke | 178,100 | 7,398 | 504,200 | 49,725 | 20,400 | 2,162 | 877,500 | 74,361 |
| Unclassified | | | 12,200 | 386 | | | 72,200 | 3,200 |
| Goosefish | | | | | | | 16,300 | 174 |
| Grayfish | 19,700 | 355 | | | | | 6,500 | 131 |
| Haddock | 1,183,000 | 35,347 | 8,036,900 | 194,983 | 31,400 | 565 | 17,879,600 | 482,010 |
| Hake | 148,500 | 3,464 | 135,600 | 2,036 | 2,100 | 32 | 8,217,100 | 130,769 |
| Halibut | 13,700 | 1,753 | 10,100 | 819 | | | 1,548,700 | 166,130 |
| Herring, sea | 876,400 | 8,276 | 500 | 6 | | | 1,115,400 | 12,934 |
| King whiting or "kingfish" | 100 | 11 | | | 900 | 30 | 10,600 | 274 |
| Launce | 4,100 | 81 | | | | | 264,400 | 3,302 |
| Mackerel | 7,263,700 | 249,522 | 106,800 | 5,188 | 102,300 | 2,089 | 10,490,400 | 467,668 |
| Menhaden | 39,000 | 357 | | | | | | |
| Pollock | 443,600 | 5,104 | 73,000 | 846 | | | 13,450,300 | 186,099 |
| Rosefish | 1,100 | 13 | | | | | 19,380,000 | 281,802 |
| Salmon | | | | | | | 4,400 | 287 |
| Scup or porgy | 43,700 | 487 | 214,200 | 4,682 | 68,900 | 753 | 5,379,500 | 112,395 |
| Sea bass | 7,400 | 640 | 35,000 | 1,682 | 9,300 | 465 | 1,562,300 | 78,657 |
| Sea robin | 13,300 | 152 | | | | | 36,100 | 573 |
| Shad | 8,400 | 360 | 400 | 17 | 100 | 11 | 38,700 | 1,882 |
| Sharks | 14,800 | 272 | | | 23,100 | 223 | 39,500 | 1,097 |
| Skates | | | 1,700 | 23 | | | 26,600 | 362 |
| Skipper or "billfish" | 600 | 68 | | | | | | |
| Smelt | | | | | | | 1,500 | 300 |
| Spot | | | | | | | 1,300 | 17 |
| Squeteagues or "sea trout," gray | 4,200 | 324 | 2,100 | 90 | 5,300 | 318 | 110,400 | 4,580 |
| Striped bass | 28,700 | 2,636 | 1,200 | 104 | 30,000 | 2,400 | 27,300 | 1,742 |
| Sturgeon | 1,400 | 156 | | | | | 4,000 | 368 |
| Swordfish | 6,000 | 772 | 150,500 | 22,789 | 104,500 | 15,377 | 1,027,000 | 170,422 |
| Tautog | 11,300 | 436 | 54,800 | 2,553 | 6,100 | 362 | 10,700 | 455 |
| Tilefish | | | 15,000 | 600 | | | | |
| Tuna | 535,800 | 16,746 | | | 100 | 5 | 149,100 | 5,949 |
| Turbot | 100 | 3 | | | | | | |
| White perch | | | 1,600 | 16 | | | 600 | 13 |
| Whiting | 11,811,500 | 108,917 | 199,900 | 2,064 | | | 3,264,700 | 36,284 |
| Wolffish | 68,900 | 1,019 | 7,400 | 186 | | | 225,600 | 5,492 |
| Crabs, hard | | | 1,000 | 70 | | | 347,600 | 9,512 |
| Lobsters | 87,200 | 30,383 | 58,200 | 14,431 | 163,800 | 40,719 | 811,900 | 204,663 |
| Clams: | | | | | | | | |
| Hard, public | 616,700 | 48,687 | 346,900 | 27,998 | 83,900 | 6,378 | | |
| Razor | 630,600 | 14,488 | | | | | | |
| Soft, public | 852,100 | 74,404 | 49,900 | 5,198 | 32,800 | 2,840 | 3,181,100 | 284,566 |
| Surf or skimmer | | | | | 1,700 | 100 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 20,100 | 7,600 | 3,300 | 625 | | | | |
| Private, spring | 163,900 | 62,350 | | | | | | |
| Periwinkles and cockles | | | 200 | 27 | | | 1,200 | 180 |
| Scallops: | | | | | | | | |
| Bay | 837,500 | 105,706 | 135,400 | 43,400 | 230,400 | 76,921 | | |
| Sea | 18,500 | 2,142 | 3,411,700 | 381,816 | 525,100 | 57,885 | 683,900 | 72,536 |
| Squid | 1,637,400 | 19,566 | 86,700 | 1,314 | 23,600 | 272 | 159,900 | 3,555 |
| Irish moss | | | | | | | 5,400 | 293 |
| Kelp | | | | | | | 120,000 | 720 |
| Bloodworms | | | | | | | 5,100 | 1,221 |
| Sandworms | | | | | | | 44,300 | 8,540 |
| Total | 33,398,700 | 991,697 | 27,386,300 | 1,222,433 | 2,944,700 | 252,697 | 116,790,200 | 3,449,250 |

### *Fisheries of Massachusetts, 1937*—Continued

CATCH: BY COUNTIES—Continued

| Species | Nantucket | | Norfolk | | Plymouth | | Suffolk | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | 430, 400 | $2, 721 | 329, 400 | $2, 649 |
| Bluefish | 27, 100 | $2, 407 | | | | | 700 | 79 |
| Butterfish | 300 | 10 | | | | | 1, 005, 900 | 27, 318 |
| Cod | 1, 384, 200 | 47, 206 | | | 105, 300 | 4, 500 | 103, 188, 100 | 1, 938, 569 |
| Croaker | | | | | | | 111, 900 | 4, 346 |
| Cunners | | | | | | | 300 | 11 |
| Cusk | | | | | | | 3, 196, 700 | 58, 466 |
| Eels: | | | | | | | | |
| Common | 3, 600 | 324 | | | | | | |
| Conger | 100 | 1 | | | | | 11, 700 | 158 |
| Flounders: | | | | | | | | |
| Gray sole | 281, 500 | 19, 204 | | | | | 6, 176, 700 | 246, 337 |
| Lemon sole | 54, 400 | 5, 836 | | | | | 2, 223, 700 | 139, 917 |
| Yellowtail and dab | 771, 400 | 18, 499 | | | 40, 000 | 600 | 5, 455, 400 | 121, 923 |
| Blackback | 1, 651, 500 | 64, 044 | | | 40, 000 | 1, 800 | 1, 074, 700 | 41, 815 |
| Fluke | 78, 800 | 8, 400 | | | | | 301, 400 | 25, 046 |
| Unclassified | | | | | | | 663, 300 | 19, 762 |
| Goosefish | | | | | | | 300 | 4 |
| Grayfish | | | | | | | 1, 400 | 42 |
| Haddock | 449, 000 | 9, 555 | | | 34, 200 | 1, 200 | 138, 969, 400 | 3, 349, 307 |
| Hake | 10, 600 | 220 | | | | | 8, 760, 300 | 146, 161 |
| Halibut | 1, 000 | 137 | | | | | 842, 200 | 84, 307 |
| Herring, sea | | | | | 900, 000 | 6, 750 | 2, 100 | 44 |
| Herring smelt | | | | | | | 10, 200 | 167 |
| Mackerel | 12, 100 | 233 | | | 12, 000 | 480 | 3, 178, 400 | 160, 912 |
| Pollock | 1, 200 | 21 | | | | | 16, 645, 900 | 267, 697 |
| Rosefish | | | | | | | 38, 834, 500 | 604, 691 |
| Scup or porgy | 100 | 1 | | | 500 | 10 | 2, 527, 600 | 57, 614 |
| Sea bass | | | | | 1, 000 | 50 | 730, 900 | 44, 220 |
| Sea robin | | | | | | | 6, 300 | 104 |
| Shad | | | | | | | 800 | 16 |
| Sharks | | | | | | | 11, 300 | 397 |
| Skates | | | | | | | 12, 800 | 181 |
| Squeteagues or "sea trout," gray | | | | | | | 6, 200 | 531 |
| Striped bass | 5, 100 | 353 | | | | | 28, 300 | 2, 536 |
| Sturgeon | 200 | 22 | | | | | 1, 700 | 116 |
| Swordfish | | | | | | | 125, 200 | 19, 913 |
| Tautog | | | | | 900 | 77 | 100 | 7 |
| Tilefish | | | | | | | 600 | 31 |
| Whiting | | | | | 3, 000 | 27 | 5, 758, 700 | 91, 922 |
| Wolffish | 100 | 1 | | | | | 2, 222, 900 | 41, 756 |
| Crabs, hard | | | 13, 600 | $379 | 186, 500 | 5, 819 | 1, 017, 000 | 24, 503 |
| Lobsters | 15, 600 | 4, 655 | 140, 000 | 38, 990 | 526, 400 | 136, 299 | 331, 800 | 90, 151 |
| Shrimp | | | | | | | 6, 800 | 475 |
| Clams: | | | | | | | | |
| Hard, public | 218, 000 | 23, 826 | 2, 700 | 109 | 32, 300 | 2, 334 | | |
| Hard, private | | | | | 10, 000 | 726 | | |
| Razor | | | | | 94, 900 | 4, 400 | | |
| Soft, public | 10, 700 | 2, 235 | 64, 500 | 7, 347 | 1, 295, 700 | 112, 088 | 27, 300 | 2, 649 |
| Soft, private | | | | | 52, 500 | 4, 375 | | |
| Oysters, market, private, spring | | | | | 20, 400 | 5, 428 | | |
| Periwinkles and cockles | 7, 200 | 300 | | | 900 | 75 | | |
| Scallops: | | | | | | | | |
| Bay | 57, 900 | 19, 290 | | | 30, 900 | 10, 300 | | |
| Sea | 400 | 59 | | | | | 337, 300 | 39, 058 |
| Squid | | | | | | | 6, 700 | 181 |
| Irish moss | | | | | 177, 000 | 15, 900 | | |
| Bloodworms | | | 4, 200 | 1, 000 | 3, 100 | 750 | 15, 000 | 3, 600 |
| Sandworms | | | 50, 000 | 9, 000 | 8, 300 | 2, 000 | 107, 300 | 19, 320 |
| Total | 5, 042, 100 | 226, 839 | 275, 000 | 56, 825 | 4, 006, 200 | 318, 709 | 344, 267, 200 | 7, 679, 009 |

## RHODE ISLAND

### *Fisheries of Rhode Island, 1937*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Gill nets |  | Lines |  |  |  | Pound nets | Floating traps |
|---|---|---|---|---|---|---|---|---|---|
|  |  | Anchor | Drift | Hand | Trawl | Troll | Trot with hooks |  |  |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | -------- | -------- | 12 | 47 | 2 | 7 | -------- | -------- | 92 |
| On boats and shore: |  |  |  |  |  |  |  |  |  |
| Regular | 8 | 1 | 2 | 82 | 16 | 39 | 1 | 24 | 45 |
| Casual | 57 | -------- | -------- | 25 | 8 | 7 | 1 | 9 | -------- |
| Total | 65 | 1 | 14 | 154 | 26 | 53 | 2 | 33 | 137 |
| Vessels: |  |  |  |  |  |  |  |  |  |
| Steam: |  |  |  |  |  |  |  |  |  |
| 5 to 10 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 2 |
| 11 to 20 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 1 |
| Total | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 3 |
| Net tonnage | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 31 |
| Motor: |  |  |  |  |  |  |  |  |  |
| 5 to 10 tons | -------- | -------- | 1 | 20 | 1 | 3 | -------- | -------- | 2 |
| 11 to 20 tons | -------- | -------- | -------- | 3 | -------- | 1 | -------- | -------- | 2 |
| 21 to 30 tons | -------- | -------- | 1 | -------- | -------- | -------- | -------- | -------- | 1 |
| Total | -------- | -------- | 2 | 23 | 1 | 4 | -------- | -------- | 5 |
| Net tonnage | -------- | -------- | 31 | 173 | 10 | 34 | -------- | -------- | 62 |
| Total vessels | -------- | -------- | 2 | 23 | 1 | 4 | -------- | -------- | 8 |
| Total net tonnage | -------- | -------- | 31 | 173 | 10 | 34 | -------- | -------- | 93 |
| Boats: |  |  |  |  |  |  |  |  |  |
| Motor | -------- | -------- | 1 | 53 | 14 | 33 | -------- | 2 | 1 |
| Other | 16 | 1 | -------- | 30 | 1 | -------- | 2 | 22 | 27 |
| Accessory boats | -------- | -------- | 2 | 11 | -------- | -------- | -------- | 3 | 20 |
| Apparatus: |  |  |  |  |  |  |  |  |  |
| Number | 16 | 4 | 28 | 244 | 69 | 117 | 3 | 36 | 36 |
| Length, yards | 2,262 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Square yards | -------- | 464 | 30,480 | -------- | -------- | -------- | -------- | -------- | -------- |
| Hooks or baits | -------- | -------- | -------- | 434 | 28,643 | 117 | 500 | -------- | -------- |

| Item | Fyke nets | Dip nets | Otter trawls | Pots |  |  |  | Harpoon | Spears | Dredges, clam |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Crab | Eel | Lobster | Periwinkle and cockle |  |  |  |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | ------- | ------- | 60 | ------- | ------- | 39 | ------- | 73 | ------- | 23 |
| On boats and shore: |  |  |  |  |  |  |  |  |  |  |
| Regular | 3 | 2 | 33 | 2 | 4 | 146 | 11 | 37 | 22 | 6 |
| Casual | ------- | 8 | 4 | ------- | 24 | 100 | 9 | 4 | 12 | 12 |
| Total | 3 | 10 | 97 | 2 | 28 | 285 | 20 | 114 | 34 | 41 |
| Vessels: |  |  |  |  |  |  |  |  |  |  |
| Steam; 11 to 20 tons | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | 1 |
| Net tonnage | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | 13 |
| Motor: |  |  |  |  |  |  |  |  |  |  |
| 5 to 10 tons | ------- | ------- | 24 | ------- | ------- | 18 | ------- | 27 | ------- | 5 |
| 11 to 20 tons | ------- | ------- | 4 | ------- | ------- | 1 | ------- | 3 | ------- | 3 |
| 21 to 30 tons | ------- | ------- | 1 | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
| Total | ------- | ------- | 29 | ------- | ------- | 19 | ------- | 30 | ------- | 8 |
| Net tonnage | ------- | ------- | 247 | ------- | ------- | 135 | ------- | 228 | ------- | 79 |
| Total vessels | ------- | ------- | 29 | ------- | ------- | 19 | ------- | 30 | ------- | 9 |
| Total net tonnage | ------- | ------- | 247 | ------- | ------- | 135 | ------- | 228 | ------- | 92 |
| Boats: |  |  |  |  |  |  |  |  |  |  |
| Motor | 2 | ------- | 20 | 1 | 10 | 137 | 14 | 20 | 1 | 9 |
| Other | ------- | 9 | ------- | ------- | 14 | 33 | 2 | ------- | 12 | ------- |
| Accessory boats | ------- | ------- | ------- | ------- | ------- | ------- | ------- | 34 | ------- | ------- |
| Apparatus: |  |  |  |  |  |  |  |  |  |  |
| Number | 105 | 10 | 49 | 30 | 858 | 29,270 | 875 | 50 | 34 | 18 |
| Yards at mouth | ------- | ------- | 1,143 | ------- | ------- | ------- | ------- | ------- | ------- | 15 |

### *Fisheries of Rhode Island, 1937*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Dredges |  |  | Tongs |  | Rakes |  | Forks | Hoes | By hand, other than for oysters | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Mussel | Oyster | Scallop | Oyster | Other | Oyster | Other |  |  |  |  |
|  | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: |  |  |  |  |  |  |  |  |  |  |  |
| On vessels |  | 90 | 3 |  |  |  |  |  |  |  | 289 |
| On boats and shore: |  |  |  |  |  |  |  |  |  |  |  |
| Regular | 6 |  | 146 | 27 | 162 | 15 | 32 | 8 | 13 |  | 429 |
| Casual |  |  | 128 | 21 | 410 | 22 | 71 | 18 | 43 | 17 | 768 |
| Total | 6 | 90 | 277 | 48 | 572 | 37 | 103 | 26 | 56 | 17 | 1,486 |
| Vessels: |  |  |  |  |  |  |  |  |  |  |  |
| Steam: |  |  |  |  |  |  |  |  |  |  |  |
| 5 to 10 tons |  |  |  |  |  |  |  |  |  |  | 2 |
| 11 to 20 tons |  |  |  |  |  |  |  |  |  |  | 1 |
| 21 to 30 tons |  | 1 |  |  |  |  |  |  |  |  | 1 |
| 41 to 50 tons |  | 1 |  |  |  |  |  |  |  |  | 1 |
| 51 to 60 tons |  | 1 |  |  |  |  |  |  |  |  | 1 |
| Total |  | 3 |  |  |  |  |  |  |  |  | 6 |
| Net tonnage |  | 126 |  |  |  |  |  |  |  |  | 157 |
| Motor: |  |  |  |  |  |  |  |  |  |  |  |
| 5 to 10 tons |  | 3 |  |  |  |  |  |  |  |  | 46 |
| 11 to 20 tons |  | 8 | 1 |  |  |  |  |  |  |  | 16 |
| 21 to 30 tons |  | 2 |  |  |  |  |  |  |  |  | 3 |
| 31 to 40 tons |  | 1 |  |  |  |  |  |  |  |  | 1 |
| 51 to 60 tons |  | 2 |  |  |  |  |  |  |  |  | 2 |
| Total |  | 16 | 1 |  |  |  |  |  |  |  | 68 |
| Net tonnage |  | 358 | 11 |  |  |  |  |  |  |  | 788 |
| Total vessels |  | 19 | 1 |  |  |  |  |  |  |  | 74 |
| Total net tonnage |  | 484 | 11 |  |  |  |  |  |  |  | 945 |
| Boats: |  |  |  |  |  |  |  |  |  |  |  |
| Motor | 3 |  | 137 | 20 | 114 | 7 | 19 |  |  |  | 357 |
| Other |  |  | 5 | 27 | 428 | 30 | 55 | 6 | 4 |  | 625 |
| Accessory boats |  |  |  |  |  |  |  |  |  |  | 62 |
| Apparatus: |  |  |  |  |  |  |  |  |  |  |  |
| Number | 4 | 37 | 705 | 48 | 572 | 37 | 103 | 15 | 56 |  |  |
| Yards at mouth | 4 | 55 | 574 |  |  |  |  |  |  |  |  |

CATCH: BY GEAR

| Species | Haul seines |  | Gill nets |  |  |  | Hand lines |  |
|---|---|---|---|---|---|---|---|---|
|  |  |  | Anchor |  | Drift |  |  |  |
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 137,400 | $1,374 |  |  |  |  |  |  |
| Bluefish | 17,200 | 1,380 |  |  | 2,500 | $200 |  |  |
| Cod |  |  |  |  |  |  | 862,700 | $25,856 |
| Eels, common | 49,400 | 3,698 |  |  |  |  | 14,400 | 1,575 |
| Flounders: |  |  |  |  |  |  |  |  |
| Blackback | 1,000 | 30 |  |  |  |  |  |  |
| Yellowtail and dab | 400 | 20 |  |  |  |  |  |  |
| Fluke | 800 | 80 |  |  |  |  |  |  |
| Herring, sea | 16,000 | 80 |  |  |  |  |  |  |
| Mackerel |  |  |  |  | 10,500 | 350 |  |  |
| Pollock |  |  |  |  | 139,000 | 1,738 | 28,600 | 341 |
| Scup or porgy | 200 | 2 |  |  |  |  |  |  |
| Silversides | 400 | 4 |  |  |  |  |  |  |
| Squeteagues or "sea trout," gray | 16,500 | 1,440 |  |  | 1,600 | 100 |  |  |
| Striped bass | 77,300 | 4,516 | 500 | $80 |  |  | 2,000 | 120 |
| Tautog | 700 | 29 |  |  |  |  | 25,800 | 1,016 |
| White perch |  |  | 1,000 | 180 |  |  |  |  |
| Whiting | 400 | 8 |  |  |  |  |  |  |
| Squid | 2,000 | 40 |  |  |  |  |  |  |
| Total | 319,700 | 12,701 | 1,500 | 260 | 153,600 | 2,388 | 933,500 | 28,908 |

## *Fisheries of Rhode Island, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Lines | | | | | | Pound nets | |
|---|---|---|---|---|---|---|---|---|
| | Trawl | | Troll | | Trot with hooks | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | | | 80,800 | $542 |
| Bluefish | | | 73,200 | $6,336 | | | 900 | 75 |
| Butterfish | | | | | | | 114,000 | 3,888 |
| Cod | 165,400 | $4,615 | | | | | | |
| Eels, common | | | | | 2,600 | $210 | 27,900 | 1,977 |
| Flounders: | | | | | | | | |
| Yellowtail and dab | | | | | | | 700 | 31 |
| Blackback | | | | | | | 21,400 | 704 |
| Fluke | | | | | | | 11,900 | 436 |
| Grayfish | 2,000 | 30 | | | | | | |
| Herring, sea | | | | | | | 13,900 | 139 |
| Mackerel | | | 157,100 | 4,601 | | | 18,400 | 777 |
| Menhaden | | | | | | | 88,000 | 697 |
| Scup or porgy | | | | | | | 13,200 | 254 |
| Sea robin | | | | | | | 10,000 | 50 |
| Shad | | | | | | | 4,200 | 405 |
| Skates | 100 | 3 | | | | | | |
| Squeteagues or "sea trout," gray | 100 | 8 | 200 | 15 | | | 12,600 | 864 |
| Striped bass | | | 30,200 | 1,872 | | | 500 | 50 |
| Tautog | | | | | | | 43,700 | 1,758 |
| Tuna | | | 300 | 15 | | | | |
| Whiting | | | | | | | 23,600 | 331 |
| Squid | | | | | | | 119,800 | 2,018 |
| Total | 167,600 | 4,656 | 261,000 | 12,839 | 2,600 | 210 | 605,500 | 14,996 |

| Species | Floating traps | | Fyke nets | | Dip nets | | Otter trawls | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Anchovies | 32,000 | $290 | | | | | | |
| Bluefish | 46,300 | 2,265 | | | | | | |
| Bonito | 43,000 | 3,733 | | | | | | |
| Butterfish | 456,400 | 15,143 | | | | | | |
| Cod | 20,400 | 494 | | | | | 18,600 | $533 |
| Crevalle | 2,000 | 20 | | | | | | |
| Cunners | 4,700 | 81 | | | | | 9,400 | 94 |
| Eels: | | | | | | | | |
| Common | | | 12,000 | $600 | | | | |
| Conger | 15,900 | 439 | | | | | | |
| Flounders: | | | | | | | | |
| Yellowtail and dab | 34,600 | 831 | | | | | 508,900 | 10,026 |
| Blackback | 112,700 | 4,508 | | | | | 1,046,300 | 33,345 |
| Fluke | 46,000 | 2,677 | | | | | 32,600 | 1,358 |
| Grayfish | 2,000 | 20 | | | | | | |
| Haddock | | | | | | | 1,200 | 39 |
| Hake | 6,600 | 120 | | | | | 11,300 | 128 |
| Herring, sea | 75,700 | 908 | | | | | 90,000 | 1,620 |
| Hickory shad | 11,100 | 174 | | | | | | |
| King whiting or "kingfish" | 2,900 | 118 | | | | | | |
| Mackerel | 408,300 | 14,104 | | | | | | |
| Menhaden | 41,000 | 159 | | | | | | |
| Pollock | 40,800 | 815 | | | | | 41,700 | 677 |
| Scup or porgy | 1,665,000 | 32,728 | | | | | | |
| Sea bass | 914,500 | 10,020 | | | | | | |
| Sea robin | 60,400 | 422 | | | | | 32,200 | 222 |
| Shad | 600 | 62 | | | | | | |
| Sharks | 3,300 | 52 | | | | | 100 | 3 |
| Skates | 39,600 | 268 | | | | | 262,400 | 1,228 |
| Spot | 400 | 8 | | | | | | |
| Squeteagues or "sea trout," gray | 33,200 | 2,207 | | | | | | |
| Striped bass | 206,600 | 18,147 | | | | | | |
| Sturgeon | 900 | 76 | | | | | | |
| Tautog | 25,300 | 660 | 3,200 | 96 | | | 800 | 32 |
| Thimble-eyed mackerel | 4,700 | 94 | | | | | | |
| Tuna | 41,900 | 2,976 | | | | | | |
| Whiting | 682,300 | 6,217 | | | | | 310,700 | 3,430 |
| Crabs: | | | | | | | | |
| Hard | 1,500 | 44 | | | 1,200 | $150 | 3,500 | 105 |
| Soft and peelers | | | | | 400 | 150 | | |
| Lobsters | | | | | | | 100 | 23 |
| Oysters, market, public, fall | | | | | 100 | 10 | | |
| Scallops: | | | | | | | | |
| Bay | | | | | 1,600 | 236 | | |
| Sea | | | | | | | 2,700 | 236 |
| Squid | 1,214,900 | 14,289 | | | | | 10,800 | 216 |
| Total | 5,529,500 | 135,169 | 15,200 | 696 | 3,300 | 546 | 2,383,300 | 53,315 |

*Fisheries of Rhode Island, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Pots | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Crab | | Eel | | Lobster | | Periwinkle and cockle | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels, common | | | 57,200 | $4,936 | | | | |
| Crabs: | | | | | | | | |
| Hard | | | | | 326,200 | $9,674 | | |
| Rock | 1,500 | $75 | 100 | 5 | | | | |
| Lobsters | | | | | 773,700 | 178,060 | | |
| Periwinkles and cockles | | | | | 300 | 15 | 60,100 | $1,617 |
| Total | 1,500 | 75 | 57,300 | 4,941 | 1,100,200 | 187,749 | 60,100 | 1,617 |

| Species | Harpoons | | Spears | | Dredges | | Tongs | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels, common | | | 13,900 | $1,334 | | | | |
| Swordfish | 333,500 | $43,603 | | | | | | |
| Clams: | | | | | | | | |
| Hard, public | | | | | 131,100 | $14,444 | 1,817,400 | $232,165 |
| Hard, private | | | | | 65,100 | 7,943 | 1,800 | 262 |
| Mussels, sea | | | | | 5,000 | 479 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | | | | | | | 1,200 | 333 |
| Public, fall | | | | | 12,300 | 2,556 | 15,700 | 1,906 |
| Private, spring | | | | | 1,839,400 | 232,242 | 2,200 | 481 |
| Private, fall | | | | | 2,379,700 | 323,287 | 2,200 | 481 |
| Scallops, bay | | | | | 97,800 | 19,123 | | |
| Starfish | | | | | 12,000 | 840 | | |
| Total | 333,500 | 43,603 | 13,900 | 1,334 | 4,542,400 | 600,914 | 1,840,500 | 235,628 |

| Species | Rakes | | Forks | | Hoes | | By hand | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams: | | | | | | | | |
| Hard, public | 265,900 | $33,464 | | | | | | |
| Soft, public | | | 73,800 | $4,960 | 79,500 | $5,662 | 17,100 | $1,071 |
| Surf or skimmer | | | | | 8,000 | 670 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 36,000 | 4,507 | | | | | | |
| Public, fall | 41,400 | 5,085 | | | | | | |
| Total | 343,300 | 43,056 | 73,800 | 4,960 | 87,500 | 6,332 | 17,100 | 1,071 |

OPERATING UNITS: BY COUNTIES

| Item | Bristol | Kent | Newport | Providence | Washington |
|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 53 | 3 | 179 | 23 | 31 |
| On boats and shore: | | | | | |
| Regular | 47 | 112 | 144 | 10 | 116 |
| Casual | 108 | 240 | 204 | 43 | 173 |
| Total | 208 | 355 | 527 | 76 | 320 |
| Vessels: | | | | | |
| Steam: | | | | | |
| 5 to 10 tons | | | 2 | | |
| 11 to 20 tons | | | 1 | | |
| 21 to 30 tons | 1 | | | | |
| 41 to 50 tons | 1 | | | | |
| 51 to 60 tons | 1 | | | | |
| Total | 3 | | 3 | | |
| Net tonnage | 126 | | 31 | | |

## *Fisheries of Rhode Island, 1937*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Bristol | Kent | Newport | Providence | Washington |
|---|---|---|---|---|---|
| Vessels—Continued. | | | | | |
| Motor: | *Number* | *Number* | *Number* | *Number* | *Number* |
| 5 to 10 tons | 3 | | 34 | 1 | 8 |
| 11 to 20 tons | 3 | 1 | 8 | 1 | 3 |
| 21 to 30 tons | 1 | | 1 | 1 | |
| 31 to 40 tons | 1 | | | | |
| 51 to 60 tons | | | | 2 | |
| Total | 8 | 1 | 43 | 5 | 11 |
| Net tonnage | 147 | 11 | 370 | 162 | 98 |
| Total vessels | 11 | 1 | 46 | 5 | 11 |
| Total net tonnage | 273 | 11 | 401 | 162 | 98 |
| Boats: | | | | | |
| Motor | 32 | 96 | 149 | 10 | 70 |
| Other | 107 | 254 | 84 | 40 | 140 |
| Accessory boats | | | 51 | 1 | 10 |
| Apparatus: | | | | | |
| Haul seines | 3 | | | 2 | 11 |
| Length, yards | 135 | | | 150 | 1,977 |
| Gill nets: | | | | | |
| Anchor | | | | | 4 |
| Square yards | | | | | 464 |
| Drift | | | 26 | | 2 |
| Square yards | | | 26,280 | | 4,200 |
| Lines: | | | | | |
| Hand | 4 | 20 | 182 | 4 | 34 |
| Hooks | 8 | 20 | 340 | 4 | 62 |
| Trawl | 2 | | 33 | | 34 |
| Hooks | 2,000 | | 12,925 | | 13,718 |
| Troll | | | 68 | | 49 |
| Hooks | | | 68 | | 49 |
| Trot with hooks | | | | 1 | 2 |
| Hooks | | | | 200 | 300 |
| Pound nets | 2 | 3 | 26 | | 5 |
| Floating traps | | | 24 | | 12 |
| Fyke nets | | 5 | 100 | | |
| Dip nets | | | | | 10 |
| Otter trawls | | | 30 | | 19 |
| Yards at mouth | | | 736 | | 407 |
| Pots: | | | | | |
| Crab | | | | | 30 |
| Eel | 50 | 187 | 50 | 130 | 441 |
| Lobster | 1,845 | 820 | 18,489 | | 8,116 |
| Periwinkle and cockle | 170 | | 265 | | 440 |
| Harpoons | | | 41 | 1 | 8 |
| Spears | 1 | 20 | | 7 | 6 |
| Dredges: | | | | | |
| Clam | | | 16 | 1 | 1 |
| Yards at mouth | | | 13 | 1 | 1 |
| Mussel | 2 | 2 | | | |
| Yards at mouth | 2 | 2 | | | |
| Oyster | 22 | 2 | 1 | 8 | 4 |
| Yards at mouth | 33 | 3 | 1 | 12 | 6 |
| Scallops | 68 | 289 | 209 | 24 | 115 |
| Yards at mouth | 53 | 244 | 164 | 19 | 94 |
| Tongs: | | | | | |
| Oyster | | 36 | 1 | | 11 |
| Other | 128 | 288 | 52 | 43 | 61 |
| Rakes: | | | | | |
| Oyster | | 12 | 1 | | 24 |
| Other | | 48 | 35 | | 20 |
| Forks | | 4 | | 2 | 9 |
| Hoes | 18 | 6 | 15 | 4 | 13 |

## *Fisheries of Rhode Island, 1937*—Continued

### CATCH: By counties

| Species | Bristol | | Kent | | Newport | | Providence | | Washington | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 22, 500 | $200 | | | 58, 300 | $342 | | | 137, 400 | $1, 374 |
| Anchovies | | | | | 32, 000 | 290 | | | | |
| Bluefish | | | | | 60, 000 | 4, 393 | | | 80, 100 | 5, 863 |
| Bonito | | | | | 39, 600 | 3, 643 | | | 3, 400 | 90 |
| Butterfish | | | 2, 500 | $125 | 471, 800 | 16, 162 | | | 96, 100 | 2, 744 |
| Cod | 100 | 4 | | | 946, 300 | 28, 539 | | | 120, 700 | 2, 955 |
| Crevalle | | | | | 2, 000 | 20 | | | | |
| Cunners | | | | | 13, 100 | 165 | | | 1, 000 | 10 |
| Eels: | | | | | | | | | | |
| Common | 2, 700 | 167 | 29, 700 | 2, 869 | 40, 800 | 2, 554 | 26, 400 | $2, 824 | 77, 800 | 5, 916 |
| Conger | | | | | 8, 300 | 287 | | | 7, 600 | 152 |
| Flounders: | | | | | | | | | | |
| Yellowtail and dab | 500 | 27 | | | 302, 700 | 5, 837 | | | 241, 400 | 5, 044 |
| Blackback | | | | | 869, 400 | 28, 165 | | | 312, 000 | 10, 422 |
| Fluke | | | | | 77, 500 | 3, 323 | | | 13, 800 | 1, 228 |
| Grayfish | 2, 000 | 30 | | | | | | | 2, 000 | 20 |
| Haddock | | | | | 1, 200 | 39 | | | | |
| Hake | | | | | 11, 500 | 195 | | | 6, 400 | 53 |
| Herring, sea | | | | | 112, 800 | 1, 976 | | | 82, 800 | 771 |
| Hickory shad | | | | | 11, 000 | 173 | | | 100 | 1 |
| King whiting or "kingfish" | | | | | 900 | 58 | | | 2, 000 | 60 |
| Mackerel | | | | | 494, 300 | 15, 626 | | | 100, 000 | 4, 206 |
| Menhaden | | | | | 12, 000 | 57 | | | 117, 000 | 799 |
| Pollock | | | | | 242, 000 | 3, 429 | | | 8, 100 | 142 |
| Scup or porgy | | | | | 1, 621, 200 | 32, 177 | | | 57, 200 | 807 |
| Sea bass | | | | | 146, 400 | 10, 014 | | | 100 | 6 |
| Sea robin | | | | | 55, 700 | 367 | | | 46, 900 | 327 |
| Shad | 4, 200 | 405 | | | 300 | 30 | | | 300 | 32 |
| Sharks | | | | | 500 | 6 | | | 2, 900 | 49 |
| Silversides | 400 | 4 | | | | | | | | |
| Skates | 100 | 3 | | | 221, 300 | 1, 175 | | | 80, 700 | 321 |
| Spot | | | | | | | | | 400 | 8 |
| Squeteagues or "sea trout," gray | 100 | 8 | 300 | 21 | 20, 800 | 1, 447 | | | 43, 000 | 3, 158 |
| Striped bass | | | | | 179, 900 | 16, 405 | | | 137, 200 | 8, 380 |
| Sturgeon | | | | | 200 | 20 | | | 700 | 56 |
| Swordfish | | | | | 308, 800 | 40, 117 | 1, 400 | 185 | 23, 300 | 3, 301 |
| Tautog | 4, 000 | 157 | 6, 200 | 246 | 50, 800 | 1, 972 | | | 38, 500 | 1, 216 |
| Thimble-eyed mackerel | | | | | 4, 700 | 94 | | | | |
| Tuna | | | | | 42, 200 | 2, 991 | | | | |
| White perch | | | | | | | | | 1, 000 | 180 |
| Whiting | 400 | 8 | | | 923, 000 | 9, 420 | | | 93, 600 | 558 |
| Crabs: | | | | | | | | | | |
| Hard | 241, 300 | 7, 240 | 26, 700 | 800 | 41, 900 | 1, 258 | | | 22, 500 | 675 |
| Soft and peelers | | | | | | | | | 400 | 150 |
| Rock | | | | | | | | | 1, 600 | 80 |
| Lobsters | 20, 800 | 5, 200 | 23, 100 | 5, 770 | 493, 700 | 116, 377 | | | 236, 200 | 50, 736 |
| Clams: | | | | | | | | | | |
| Hard, public | 734, 300 | 91, 538 | 985, 400 | 131, 408 | 188, 500 | 21, 670 | 116, 300 | 14, 594 | 189, 900 | 20, 863 |
| Hard, private | 58, 700 | 7, 343 | 6, 400 | 600 | | | 1, 800 | 262 | | |
| Soft, public | 25, 900 | 1, 621 | 43, 500 | 3, 266 | 6, 400 | 510 | 33, 000 | 2, 062 | 61, 600 | 4, 234 |
| Surf or skimmers | | | | | 8, 000 | 670 | | | | |
| Mussels, sea | 1, 900 | 187 | 3, 100 | 292 | | | | | | |
| Oysters, market: | | | | | | | | | | |
| Public, spring | | | | | | | | | 37, 200 | 4, 840 |
| Public, fall | | | 19, 200 | 2, 063 | 400 | 60 | | | 49, 900 | 7, 434 |
| Private, spring | 870, 200 | 99, 469 | 63, 000 | 9, 000 | | | 834, 200 | 114, 172 | 74, 200 | 10, 082 |
| Private, fall | 1, 298, 500 | 175, 916 | 63, 000 | 9, 000 | | | 874, 200 | 119, 172 | 146, 200 | 19, 680 |
| Periwinkles and cockles | 9, 000 | 500 | | | 13, 000 | 677 | | | 38, 400 | 455 |
| Scallops: | | | | | | | | | | |
| Bay | 9, 600 | 1, 199 | 38, 000 | 7, 912 | 20, 700 | 4, 300 | 2, 900 | 360 | 28, 200 | 5, 588 |
| Sea | | | | | | | | | 2, 700 | 236 |
| Squid | 2, 000 | 40 | | | 783, 900 | 10, 711 | | | 561, 600 | 5, 812 |
| Starfish | | | | | 12, 000 | 840 | | | | |
| Total | 3, 309, 200 | 391, 266 | 1, 310, 100 | 173, 372 | 8, 951, 800 | 388, 581 | 1, 890, 200 | 253, 631 | 3, 386, 100 | 191, 114 |

### *Fisheries of Rhode Island, 1937*—Continued

SEED OYSTER FISHERY: BY GEAR

| Item | Dredges | | Tongs | | Total, exclusive of duplication | |
|---|---|---|---|---|---|---|
| OPERATING UNITS | | | | | | |
| Fishermen: | *Number* | | *Number* | | *Number* | |
| On vessels | 4 | | -------- | | 4 | |
| On boats and shore: | | | | | | |
| Regular | -------- | | 2 | | 2 | |
| Casual | -------- | | 2 | | 2 | |
| Total | 4 | | 4 | | 8 | |
| Vessels, motor | 1 | | -------- | | 1 | |
| Net tonnage | 19 | | -------- | | 19 | |
| Boats: | | | | | | |
| Motor | -------- | | 2 | | 2 | |
| Other | -------- | | 2 | | 2 | |
| Apparatus: | | | | | | |
| Dredges | 2 | | -------- | | 2 | |
| Yards at mouth | 3 | | -------- | | 3 | |
| Tongs | -------- | | 4 | | 4 | |
| CATCH | | | | | | |
| Oysters, seed: | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* |
| Public, spring | 12,000 | $12,000 | -------- | -------- | 12,000 | $12,000 |
| Public, fall | -------- | -------- | 915 | $549 | 915 | 549 |
| Total | 12,000 | 12,000 | 915 | 549 | 12,915 | 12,549 |

NOTE.—All of the persons, craft, and gear engaged in the seed-oyster fishery are duplicated among those fishing for market oysters or other species. The seed-oyster fishery in Rhode Island was confined to Bristol County.

## CONNECTICUT

### *Fisheries of Connecticut, 1937*

OPERATING UNITS: BY GEAR

| Item | Purse seines, mackerel | Haul seines | Gill nets | | Lines | | Pound nets |
|---|---|---|---|---|---|---|---|
| | | | Drift | Stake | Hand | Trot with hooks | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | -------- | -------- | -------- | -------- | 35 | -------- | -------- |
| On boats and shore: | | | | | | | |
| Regular | 3 | 17 | 14 | -------- | 67 | 3 | 12 |
| Casual | -------- | 97 | 46 | 12 | 12 | 4 | 4 |
| Total | 3 | 114 | 60 | 12 | 114 | 7 | 16 |
| Vessels, motor: | | | | | | | |
| 5 to 10 tons | -------- | -------- | -------- | -------- | 6 | -------- | -------- |
| 11 to 20 tons | -------- | -------- | -------- | -------- | 6 | -------- | -------- |
| 21 to 30 tons | -------- | -------- | -------- | -------- | 1 | -------- | -------- |
| Total | -------- | -------- | -------- | -------- | 13 | -------- | -------- |
| Net tonnage | -------- | -------- | -------- | -------- | 145 | -------- | -------- |
| Boats: | | | | | | | |
| Motor | 1 | 5 | 25 | 1 | 43 | 4 | 7 |
| Other | -------- | 30 | 5 | 5 | 4 | 3 | 5 |
| Accessory boats | 1 | -------- | -------- | -------- | -------- | -------- | -------- |
| Apparatus: | | | | | | | |
| Number | 1 | 37 | 30 | 24 | 117 | 26 | 15 |
| Length, yards | 120 | 3,723 | -------- | -------- | -------- | -------- | -------- |
| Square yards | -------- | -------- | 58,450 | 4,740 | -------- | -------- | -------- |
| Hooks, baits, or snoods | -------- | -------- | -------- | -------- | 147 | 2,800 | -------- |

*Fisheries of Connecticut, 1937*—Continued

OPERATING UNITS: By gear—Continued

| Item | Fyke nets | Dip nets | Scap nets | Otter trawls | Pots | | Harpoons | Spears |
|---|---|---|---|---|---|---|---|---|
| | | | | | Eel | Lobster | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | 88 | | 10 | 40 | |
| On boats and shore: | | | | | | | | |
| Regular | 11 | 20 | | 39 | 23 | 169 | 8 | 6 |
| Casual | 15 | 197 | 12 | 4 | 23 | 64 | 2 | 1 |
| Total | 26 | 217 | 12 | 131 | 46 | 243 | 50 | 7 |
| Vessels, motor: | | | | | | | | |
| 5 to 10 tons | | | | 18 | | 5 | 6 | |
| 11 to 20 tons | | | | 14 | | | 5 | |
| 21 to 30 tons | | | | 3 | | | 1 | |
| Total | | | | 35 | | 5 | 12 | |
| Net tonnage | | | | 416 | | 38 | 143 | |
| Boats: | | | | | | | | |
| Motor | 6 | 1 | | 25 | 10 | 156 | 4 | |
| Other | 12 | 212 | | | 31 | 21 | | 6 |
| Accessory boats | | | | | | | 14 | |
| Apparatus: | | | | | | | | |
| Number | 97 | 215 | 12 | 60 | 989 | 15,772 | 16 | 6 |
| Yards at mouth | | | | 1,538 | | | | |

| Item | Dredges, oyster | Tongs | | Rakes | | Hoes | By hand, other than for oysters | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| | | Oyster | Other | Oyster | Other | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 218 | | | | | | | 316 |
| On boats and shore: | | | | | | | | |
| Regular | 11 | 31 | 18 | | 20 | 27 | | 295 |
| Casual | | 7 | 43 | 2 | 43 | 8 | 50 | 575 |
| Total | 229 | 38 | 61 | 2 | 63 | 35 | 50 | 1,186 |
| Vessels: | | | | | | | | |
| Steam: | | | | | | | | |
| 51 to 60 tons | 1 | | | | | | | 1 |
| 131 to 140 tons | 1 | | | | | | | 1 |
| 291 to 300 tons | 1 | | | | | | | 1 |
| 391 to 400 tons | 1 | | | | | | | 1 |
| Total | 4 | | | | | | | 4 |
| Net tonnage | 878 | | | | | | | 878 |
| Motor: | | | | | | | | |
| 5 to 10 tons | 8 | | | | | | | 29 |
| 11 to 20 tons | 9 | | | | | | | 24 |
| 21 to 30 tons | 7 | | | | | | | 10 |
| 61 to 70 tons | 3 | | | | | | | 3 |
| 111 to 120 tons | 1 | | | | | | | 1 |
| 141 to 150 tons | 1 | | | | | | | 1 |
| Total | 29 | | | | | | | 68 |
| Net tonnage | 815 | | | | | | | 1,267 |
| Total vessels | 33 | | | | | | | 72 |
| Total net tonnage | 1,693 | | | | | | | 2,145 |
| Boats: | | | | | | | | |
| Motor | 5 | | | | | | | 230 |
| Other | | 35 | 61 | 1 | 63 | 4 | | 461 |
| Accessory boats | | | | | | | | 15 |
| Apparatus: | | | | | | | | |
| Number | 78 | 38 | 61 | 2 | 63 | 35 | | |
| Yards at mouth | 100 | | | | | | | |

## *Fisheries of Connecticut, 1937*—Continued

### CATCH: BY GEAR

| Species | Purse seines | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Drift | | Stake | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Carp | -------- | -------- | 32,300 | $2,545 | -------- | -------- | 4,000 | $270 |
| Mackerel | 2,200 | $132 | -------- | -------- | -------- | -------- | -------- | -------- |
| Minnows | -------- | -------- | 2,100 | 700 | -------- | -------- | -------- | -------- |
| Mummichog | -------- | -------- | 1,000 | 200 | -------- | -------- | -------- | -------- |
| Shad | -------- | -------- | 125,200 | 7,297 | 240,200 | $15,965 | 2,800 | 152 |
| Smelt | -------- | -------- | 1,500 | 680 | -------- | -------- | -------- | -------- |
| Squeteagues or "sea trout," gray | -------- | -------- | 700 | 70 | -------- | -------- | -------- | -------- |
| Striped bass | -------- | -------- | 900 | 135 | -------- | -------- | -------- | -------- |
| Suckers | -------- | -------- | 48,800 | 2,283 | -------- | -------- | -------- | -------- |
| Total | 2,200 | 132 | 212,500 | 13,910 | 240,200 | 15,965 | 6,800 | 422 |

| Species | Lines | | | | Pound nets | | Fyke nets | |
|---|---|---|---|---|---|---|---|---|
| | Hand | | Trot with hooks | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | -------- | -------- | -------- | -------- | 80,000 | $800 | 4,800 | $51 |
| Bluefish | 33,400 | $4,630 | -------- | -------- | 200 | 24 | -------- | -------- |
| Butterfish | -------- | -------- | -------- | -------- | 26,700 | 1,758 | -------- | -------- |
| Carp | -------- | -------- | -------- | -------- | -------- | -------- | 3,200 | 240 |
| Catfish and bullheads | -------- | -------- | -------- | -------- | -------- | -------- | 300 | 2 |
| Cod | 2,100 | 105 | -------- | -------- | -------- | -------- | -------- | -------- |
| Eels: | | | | | | | | |
| Common | 2,700 | 250 | 11,300 | $1,085 | -------- | -------- | 3,400 | 634 |
| Conger | -------- | -------- | -------- | -------- | 400 | 24 | -------- | -------- |
| Flounders, blackback | 700 | 33 | -------- | -------- | 3,100 | 291 | 200 | 18 |
| Hickory shad | -------- | -------- | -------- | -------- | 1,700 | 85 | -------- | -------- |
| Lamprey | -------- | -------- | -------- | -------- | -------- | -------- | 2,800 | 300 |
| Mackerel | 74,100 | 4,500 | -------- | -------- | 700 | 70 | -------- | -------- |
| Menhaden | -------- | -------- | -------- | -------- | 126,000 | 1,175 | -------- | -------- |
| Pollock | 2,500 | 85 | -------- | -------- | -------- | -------- | -------- | -------- |
| Scup or porgy | 2,800 | 90 | -------- | -------- | 500 | 25 | -------- | -------- |
| Sea bass | 1,200 | 72 | -------- | -------- | -------- | -------- | -------- | -------- |
| Shad | -------- | -------- | -------- | -------- | 6,800 | 355 | -------- | -------- |
| Skates | -------- | -------- | -------- | -------- | 500 | 8 | -------- | -------- |
| Squeteagues or "sea trout," gray | -------- | -------- | -------- | -------- | 7,800 | 829 | -------- | -------- |
| Striped bass | 600 | 42 | -------- | -------- | 11,300 | 1,687 | -------- | -------- |
| Suckers | -------- | -------- | -------- | -------- | 3,000 | 120 | 57,100 | 1,860 |
| Tautog | 15,900 | 1,156 | -------- | -------- | 4,700 | 369 | -------- | -------- |
| Whiting | -------- | -------- | -------- | -------- | 400 | 16 | -------- | -------- |
| Crabs, hard | 2,400 | 150 | -------- | -------- | -------- | -------- | -------- | -------- |
| Squid | -------- | -------- | -------- | -------- | 5,900 | 236 | -------- | -------- |
| Total | 138,400 | 11,113 | 11,300 | 1,085 | 279,700 | 7,872 | 71,800 | 3,105 |

### *Fisheries of Connecticut, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Dip nets | | Scap nets | | Otter trawls | | Pots, eel | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Butterfish | | | | | 12,400 | $771 | | |
| Cod | | | | | 157,300 | 6,022 | | |
| Cunners | | | | | 1,000 | 20 | | |
| Eels: | | | | | | | | |
| Common | | | | | | | 53,500 | $4,727 |
| Conger | | | | | 1,000 | 50 | | |
| Flounders: | | | | | | | | |
| Lemon sole | | | | | 24,800 | 1,984 | | |
| Yellowtail and dab | | | | | 2,616,900 | 73,526 | | |
| Blackback | | | | | 3,170,400 | 121,902 | | |
| Fluke | | | | | 407,200 | 33,376 | | |
| Goosefish | | | | | 20,000 | 150 | | |
| Haddock | | | | | 63,400 | 2,515 | | |
| Hake | | | | | 18,100 | 566 | | |
| Halibut | | | | | 700 | 77 | | |
| Pollock | | | | | 100 | 3 | | |
| Scup or porgy | | | | | 145,700 | 4,274 | | |
| Sea bass | | | | | 58,900 | 5,088 | | |
| Sea robin | | | | | 22,400 | 448 | | |
| Shad | | | 7,900 | $395 | | | | |
| Skates | | | | | 55,500 | 580 | | |
| Smelt | 200 | $30 | | | | | | |
| Squirrel hake | | | | | 3,600 | 90 | | |
| Sturgeon | | | | | 100 | 13 | | |
| Tautog | | | | | 300 | 18 | | |
| Whiting | | | | | 424,800 | 9,089 | | |
| Crabs: | | | | | | | | |
| Hard | 4,200 | 274 | | | | | | |
| Soft and peelers | 200 | 67 | | | | | | |
| Scallops, bay | 89,600 | 18,250 | | | | | | |
| Squid | | | | | 13,200 | 528 | | |
| Total | 94,200 | 18,621 | 7,900 | 395 | 7,217,800 | 261,090 | 53,500 | 4,727 |

| Species | Pots, lobster | | Harpoons | | Spears | | Dredges | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels, common | | | | | 3,800 | $364 | | |
| Swordfish | | | 49,000 | $6,685 | | | | |
| Lobsters | 522,900 | $140,712 | | | | | | |
| Clams, hard, private | | | | | | | 800 | $150 |
| Conchs | 19,200 | 815 | | | | | | |
| Oysters, market: | | | | | | | | |
| Private, spring | | | | | | | 3,292,600 | 402,281 |
| Private, fall | | | | | | | 3,514,200 | 490,661 |
| Total | 542,100 | 141,527 | 49,000 | 6,685 | 3,800 | 364 | 6,807,600 | 893,092 |

| Species | Tongs | | Rakes | | Hoes | | By hand | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams: | | | | | | | | |
| Hard, public | 84,100 | $16,913 | 103,600 | $22,855 | | | 15,000 | $3,000 |
| Soft, public | | | | | 51,200 | $6,754 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 8,100 | 966 | | | | | | |
| Public, fall | 48,600 | 5,637 | | | | | | |
| Private, spring | 3,000 | 1,000 | 400 | 137 | | | | |
| Private, fall | 10,200 | 2,312 | 400 | 138 | | | | |
| Total | 154,000 | 26,828 | 104,400 | 23,130 | 51,200 | 6,754 | 15,000 | 3,000 |

## *Fisheries of Connecticut, 1937*—Continued

### OPERATING UNITS: BY COUNTIES

| Item | Fairfield | Hartford | Middlesex | New Haven | New London |
|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 82 | | 5 | 152 | 77 |
| On boats and shore: | | | | | |
| Regular | 44 | 6 | 45 | 55 | 145 |
| Casual | 119 | 71 | 91 | 35 | 259 |
| Total | 245 | 77 | 141 | 212 | 481 |
| Vessels: | | | | | |
| Steam: | | | | | |
| 51 to 60 tons | 1 | | | | |
| 131 to 140 tons | | | | 1 | |
| 291 to 300 tons | | | | 1 | |
| 391 to 400 tons | | | | 1 | |
| Total | 1 | | | 3 | |
| Net tonnage | 51 | | | 827 | |
| Motor: | | | | | |
| 5 to 10 tons | 9 | | 1 | 7 | 12 |
| 11 to 20 tons | 4 | | 1 | 6 | 13 |
| 21 to 30 tons | 5 | | | 2 | 3 |
| 61 to 70 tons | 1 | | | 2 | |
| 111 to 120 tons | | | | 1 | |
| 141 to 150 tons | | | | 1 | |
| Total | 19 | | 2 | 19 | 28 |
| Net tonnage | 314 | | 22 | 576 | 355 |
| Total vessels | 20 | | 2 | 22 | 28 |
| Total net tonnage | 365 | | 22 | 1, 403 | 355 |
| Boats: | | | | | |
| Motor | 28 | 5 | 52 | 44 | 101 |
| Other | 120 | 14 | 47 | 37 | 243 |
| Accessory boats | 1 | | 2 | 1 | 11 |
| Apparatus: | | | | | |
| Purse seines, mackerel | | | | | 1 |
| Length, yards | | | | | 120 |
| Haul seines | 1 | 13 | 12 | 8 | 3 |
| Length, yards | 83 | 1, 891 | 1, 340 | 142 | 267 |
| Gill nets: | | | | | |
| Drift | 1 | 1 | 21 | | 7 |
| Square yards | 2, 200 | 300 | 36, 050 | | 19, 900 |
| Stake | | 5 | 19 | | |
| Square yards | | 1, 100 | 3, 640 | | |
| Lines: | | | | | |
| Hand | 4 | | 20 | 13 | 80 |
| Hooks | 4 | | 32 | 15 | 96 |
| Trot with hooks | 2 | | | 21 | |
| Hooks | 400 | | | 2, 400 | |
| Pound nets | | | 3 | 2 | 10 |
| Fyke nets | | 31 | 31 | | 35 |
| Dip nets | 3 | | 3 | 1 | 208 |
| Scap nets | | 12 | | | |
| Otter trawls | 4 | | 4 | 6 | 46 |
| Yards at mouth | 96 | | 85 | 148 | 1, 209 |
| Pots: | | | | | |
| Eel | 6 | 61 | 176 | 101 | 645 |
| Lobster | 3, 439 | | 1, 710 | 3, 806 | 6, 817 |
| Harpoons | 1 | | 2 | 1 | 12 |
| Spears | 1 | | | 4 | 1 |
| Dredges, oyster | 32 | | | 44 | 2 |
| Yards at mouth | 39 | | | 59 | 2 |
| Tongs: | | | | | |
| Oyster | 4 | | 19 | 12 | 3 |
| Other | 57 | | | 4 | |
| Rakes: | | | | | |
| Oyster | 2 | | | | |
| Other | 60 | | | 3 | |
| Hoes | 16 | | 2 | 9 | 8 |

*Fisheries of Connecticut, 1937*—Continued

CATCH: BY COUNTIES

| Species | Fairfield | | Hartford | | Middlesex | | New Haven | | New London | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 4,800 | $51 | | | | | 80,000 | $800 |
| Bluefish | 800 | $76 | | | 7,400 | $1,220 | 700 | $72 | 24,700 | 3,286 |
| Butterfish | | | | | | | 5,300 | 219 | 33,800 | 2,310 |
| Carp | | | 17,500 | 1,415 | 17,800 | 1,330 | | | 4,200 | 310 |
| Catfish and bullheads | | | | | | | | | 300 | 2 |
| Cod | | | | | | | 500 | 25 | 158,900 | 6.102 |
| Cunners | | | | | | | | | 1,000 | 20 |
| Eels: | | | | | | | | | | |
| Common | 2,600 | 221 | 3,200 | 320 | 9,300 | 805 | 24,200 | 2,340 | 35,400 | 3,374 |
| Conger | | | | | | | | | 1,400 | 74 |
| Flounders: | | | | | | | | | | |
| Lemon sole | | | | | | | | | 24,800 | 1,984 |
| Yellowtail and dab | | | | | 48,000 | 1,440 | 7,400 | 222 | 2,561,500 | 71,864 |
| Blackback | 86,000 | 3,100 | | | 15,300 | 689 | 107,000 | 4,518 | 2,966,100 | 113,937 |
| Fluke | | | | | 5,200 | 443 | 8,000 | 640 | 394,000 | 32,293 |
| Goosefish | | | | | | | | | 20,000 | 150 |
| Haddock | | | | | | | | | 63,400 | 2,515 |
| Hake | | | | | | | | | 18,100 | 566 |
| Halibut | | | | | | | | | 700 | 77 |
| Hickory shad | | | | | | | | | 1,700 | 85 |
| Lamprey | | | 2,800 | 300 | | | | | | |
| Mackerel | | | | | 2,000 | 100 | 4,000 | 200 | 71,000 | 4,402 |
| Menhaden | | | | | | | 26,000 | 260 | 100,000 | 915 |
| Minnows | | | | | | | 2,100 | 700 | | |
| Mummichog | | | | | | | 1,000 | 200 | | |
| Pollock | | | | | 1,500 | 45 | | | 1,100 | 43 |
| Scup or porgy | | | | | | | 500 | 15 | 148,500 | 4,374 |
| Sea bass | | | | | | | | | 60,100 | 5,160 |
| Sea robin | | | | | | | | | 22,400 | 448 |
| Shad | 8,000 | 440 | 78,800 | 4,349 | 213,400 | 13,941 | 400 | 34 | 82,300 | 5.400 |
| Skates | 1,300 | 13 | | | | | | | 54,700 | 575 |
| Smelt | 1,300 | 650 | | | | | | | 400 | 60 |
| Squeteagues or "sea trout," gray | | | | | | | 800 | 45 | 7,700 | 854 |
| Squirrel hake | | | | | | | | | 3,600 | 90 |
| Striped bass | | | | | | | | | 12,800 | 1,864 |
| Sturgeon | | | | | | | | | 100 | 13 |
| Suckers | | | 37,900 | 1,066 | 65,900 | 2,954 | | | 5,100 | 243 |
| Swordfish | 5,000 | 700 | | | 13,000 | 1,700 | 5,700 | 700 | 25,300 | 3,585 |
| Tautog | | | | | 5,600 | 500 | 1,300 | 105 | 14,000 | 938 |
| Whiting | | | | | | | 5,300 | 106 | 419,900 | 8,999 |
| Crabs: | | | | | | | | | | |
| Hard | 2,300 | 121 | | | | | 2,500 | 160 | 1,800 | 143 |
| Soft and peelers | | | | | | | | | 200 | 67 |
| Lobsters | 47,400 | 14,994 | | | 60,700 | 16,940 | 145,800 | 43,313 | 269,000 | 65,465 |
| Clams: | | | | | | | | | | |
| Hard, public | 195,700 | 41,176 | | | | | 7,000 | 1,592 | | |
| Hard, private | 800 | 150 | | | | | | | | |
| Soft, public | 15,200 | 2.380 | | | 1,100 | 169 | 5,400 | 1,180 | 29,500 | 3,025 |
| Conchs | | | | | 2,200 | 115 | 17,000 | 700 | | |
| Oysters, market: | | | | | | | | | | |
| Public, spring | | | | | 6,700 | 766 | | | 1,400 | 200 |
| Public, fall | | | | | 12,100 | 1,650 | 35,000 | 3,787 | 1,500 | 200 |
| Private, spring | 1,329,500 | 253,126 | | | | | 1,950,700 | 146,592 | 15,800 | 3,700 |
| Private, fall | 1,616,300 | 318,185 | | | 400 | 55 | 1,896,300 | 171,964 | 11,800 | 2,907 |
| Scallops, bay | | | | | 3,900 | 800 | | | 85,700 | 17,450 |
| Squid | | | | | | | | | 19,100 | 764 |
| Total | 3,312,200 | 635,332 | 145,000 | 7,501 | 491,500 | 45,662 | 4,259,900 | 379,689 | 7,854,800 | 371.633 |

*Fisheries of Connecticut, 1937*—Continued

SEED OYSTER FISHERY: BY GEAR

| Item | Dredges | Tongs | Rakes | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|
| OPERATING UNITS | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 182 | 3 | | | 185 |
| On boats and shore: | | | | | |
| Regular | 11 | 69 | 1 | 87 | 160 |
| Casual | 13 | 21 | 10 | 34 | 69 |
| Total | 206 | 93 | 11 | 121 | 414 |
| Vessels: | | | | | |
| Steam | 3 | | | | 3 |
| Net tonnage | 279 | | | | 279 |
| Motor | 18 | 1 | | | 19 |
| Net tonnage | 434 | 8 | | | 442 |
| Sail | 23 | | | | 23 |
| Net tonnage | 169 | | | | 169 |
| Total vessels | 44 | 1 | | | 45 |
| Total net tonnage | 882 | 8 | | | 890 |
| Boats: | | | | | |
| Motor | | 1 | | | 1 |
| Other | 9 | 91 | 11 | | 109 |
| Apparatus: | | | | | |
| Number | 191 | 93 | 11 | | |
| Yards at mouth | 169 | | | | |

| Item | Dredges | | Tongs | | Rakes | | By hand | | Total, exclusive of duplication | |
|---|---|---|---|---|---|---|---|---|---|---|
| CATCH | | | | | | | | | | |
| Oysters, seed: | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* |
| Public, spring | 36, 411 | $26, 585 | 9, 034 | $5, 550 | | | 5, 500 | $3, 550 | 50, 945 | $35, 685 |
| Public, fall | 17, 122 | 13, 925 | 12, 100 | 8, 200 | 4, 900 | $2, 150 | 8, 050 | 5, 032 | 42, 172 | 29, 307 |
| Private, spring | 284, 800 | 278, 700 | | | | | | | 284, 800 | 278, 700 |
| Private, fall | 63, 727 | 60, 492 | | | | | | | 63, 727 | 60, 492 |
| Total | 402, 060 | 379, 702 | 21, 134 | 13, 750 | 4, 900 | 2, 150 | 13, 550 | 8, 582 | 441, 644 | 404, 184 |

SEED OYSTER FISHERY: BY COUNTIES

| Item | Fairfield | | New Haven | |
|---|---|---|---|---|
| OPERATING UNITS | | | | |
| Fishermen: | *Number* | | *Number* | |
| On vessels | 99 | | 86 | |
| On boats and shore: | | | | |
| Regular | 152 | | 8 | |
| Casual | 67 | | 2 | |
| Total | 318 | | 96 | |
| Vessels: | | | | |
| Steam | 2 | | 1 | |
| Net tonnage | 174 | | 105 | |
| Motor | 4 | | 15 | |
| Net tonnage | 127 | | 315 | |
| Sail | 19 | | 4 | |
| Net tonnage | 143 | | 26 | |
| Total vessels | 25 | | 20 | |
| Total net tonnage | 444 | | 446 | |
| Boats: | | | | |
| Motor | 1 | | | |
| Other | 100 | | 9 | |
| Apparatus: | | | | |
| Dredges | 143 | | 48 | |
| Yards at mouth | 110 | | 59 | |
| Tongs | 86 | | 7 | |
| Rakes | 8 | | 3 | |
| CATCH | | | | |
| Oysters, seed: | *Bushels* | *Value* | *Bushels* | *Value* |
| Public, spring | 38, 164 | $26, 090 | 12, 781 | $9, 595 |
| Public, fall | 28, 701 | 20, 140 | 13, 471 | 9, 167 |
| Private, spring | 108, 600 | 104, 000 | 176, 200 | 174, 700 |
| Private, fall | 2, 000 | 1, 600 | 61, 727 | 58, 892 |
| Total | 177, 465 | 151, 830 | 264, 179 | 252, 354 |

NOTE.—Of the total number of persons fishing for seed oysters, 217 are duplicated among those fishing for market oysters or other species. Similarly the following craft and gear are duplicated: 7 vessels, 1 motorboat, 53 other boats, and 14 dredges.

## VESSEL FISHERIES AT PRINCIPAL NEW ENGLAND PORTS

Due to the importance of the ports of Boston and Gloucester, Mass., and Portland, Maine, as landing points for fishery products, detailed monthly statistics are collected for these landings which are published in the following section:

### ECONOMIC ASPECT

The landings of fishery products at the three principal New England ports (Boston and Gloucester, Mass., and Portland, Maine) by vessels of 5 net tons capacity or more during 1937, amounted to 387,960,010 pounds as landed, valued at $9,789,879. This is a decrease of 6 percent in the quantity of the catch as compared with 1936, and also a decrease of 12 percent in the value of the catch. The landings at Boston accounted for 324,599,527 pounds valued at $8,467,985, or 84 percent of the total volume; the landings at Gloucester amounted to 46,238,971 pounds valued at $918,008, or 12 percent of the total; and the landings at Portland amounted to 17,121,512 pounds, valued at $403,886, or 4 percent of the total.

Among the landings of fresh fish, haddock far outranked other species in volume landed. Landings of all sizes of haddock in 1937 amounted to 137,175,269 pounds, or 35 percent of the total fresh fish.

*Landings by fishing vessels at the three principal New England ports, 1937*

BOSTON: BY MONTHS

| Species | January | | February | | March | | April | | May | | June | | July | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod, fresh: | | | | | | | | | | | | | | |
| Large | 2,078,625 | $74,444 | 3,753,695 | $100,045 | 4,650,095 | $112,843 | 3,245,820 | $70,514 | 2,719,245 | $56,945 | 2,225,550 | $53,018 | 1,870,720 | $41,580 |
| Market | 2,457,380 | 72,255 | 2,394,435 | 65,032 | 3,286,925 | 77,182 | 4,202,740 | 72,509 | 5,395,710 | 87,661 | 6,575,873 | 91,200 | 7,113,300 | 95,826 |
| Scrod | 178,985 | 4,318 | 139,975 | 2,903 | 115,650 | 2,243 | 123,400 | 1,799 | 390,450 | 4,918 | 469,330 | 5,023 | 225,900 | 2,395 |
| Haddock, fresh: | | | | | | | | | | | | | | |
| Large | 7,097,310 | 263,129 | 11,569,745 | 313,908 | 14,932,970 | 360,836 | 12,467,910 | 272,152 | 7,441,430 | 201,364 | 7,952,385 | 210,422 | 6,928,980 | 186,253 |
| Scrod | 1,152,147 | 33,149 | 1,791,240 | 42,360 | 2,970,435 | 60,977 | 2,104,925 | 39,805 | 1,842,691 | 39,504 | 3,270,740 | 62,807 | 3,487,280 | 69,069 |
| Hake, fresh: | | | | | | | | | | | | | | |
| Large | 578,350 | 19,607 | 404,980 | 16,389 | 421,660 | 14,822 | 508,405 | 12,823 | 608,880 | 10,712 | 652,750 | 9,701 | 625,260 | 8,531 |
| Small | 41,500 | 1,419 | 22,925 | 834 | 10,900 | 314 | 28,350 | 752 | 83,500 | 2,137 | 123,450 | 2,474 | 238,860 | 4,192 |
| Pollock, fresh | 1,383,950 | 30,151 | 1,980,915 | 34,662 | 1,205,315 | 23,617 | 1,185,385 | 18,833 | 435,800 | 7,692 | 527,990 | 9,526 | 496,620 | 9,338 |
| Cusk, fresh | 510,590 | 14,921 | 497,500 | 12,263 | 501,645 | 10,988 | 658,397 | 9,650 | 312,390 | 5,190 | 166,110 | 2,993 | 199,185 | 2,560 |
| Halibut, fresh | 40,963 | 6,963 | 183,967 | 26,191 | 238,573 | 33,979 | 286,889 | 28,046 | 225,234 | 22,550 | 259,929 | 25,559 | 237,246 | 27,270 |
| Mackerel, fresh | | | | | | | 93,915 | 8,298 | 2,653,040 | 77,507 | 1,150,880 | 41,876 | 829,260 | 40,117 |
| Flounders, fresh: | | | | | | | | | | | | | | |
| Gray sole | 1,350,930 | 34,797 | 654,604 | 29,662 | 1,084,745 | 38,357 | 440,610 | 20,935 | 524,140 | 20,553 | 359,730 | 13,551 | 414,115 | 16,042 |
| Lemon sole | 277,070 | 18,819 | 100,513 | 9,307 | 94,335 | 9,000 | 182,390 | 14,408 | 440,115 | 11,629 | 286,655 | 11,107 | 190,114 | 12,809 |
| Yellowtail | 278,585 | 6,637 | 67,482 | 2,546 | 137,980 | 5,062 | 257,515 | 7,540 | 483,013 | 7,497 | 298,235 | 4,751 | 332,390 | 7,935 |
| Blackback | 100,875 | 4,524 | 29,695 | 1,877 | 19,205 | 1,282 | 55,810 | 2,674 | 98,735 | 1,975 | 75,595 | 1,664 | 69,870 | 2,512 |
| Dab | 180,355 | 2,843 | 76,595 | 2,700 | 112,395 | 3,211 | 190,315 | 4,800 | 374,350 | 4,939 | 375,225 | 6,224 | 128,095 | 2,424 |
| Other | 86,110 | 2,052 | 63,990 | 2,683 | 182,320 | 5,527 | 68,490 | 2,837 | 148,265 | 2,318 | 48,995 | 876 | 31,090 | 822 |
| Swordfish, fresh | | | | | | | | | | | 75,438 | 22,803 | 455,134 | 82,362 |
| Whiting, fresh | 27,125 | 686 | 3,475 | 148 | 6,190 | 151 | 57,410 | 1,875 | 183,930 | 2,164 | 1,440,650 | 18,491 | 1,287,900 | 12,650 |
| Wolffish, fresh | 91,570 | 2,588 | 138,670 | 4,040 | 295,255 | 7,839 | 516,585 | 8,214 | 337,015 | 5,897 | 163,815 | 3,485 | 63,680 | 2,071 |
| Rosefish, fresh | 3,276,501 | 36,655 | 545,016 | 4,979 | 253,735 | 3,492 | 190,850 | 3,653 | 3,987,231 | 50,453 | 3,486,735 | 41,989 | 3,462,712 | 46,772 |
| Other, fresh | 5,351 | 187 | 3,025 | 41 | 3,437 | 91 | 155 | 3 | 1,860 | 89 | 8,875 | 256 | 16,025 | 452 |
| Total | 21,194,272 | 630,144 | 24,425,442 | 672,570 | 30,523,765 | 771,813 | 26,866,266 | 602,120 | 28,687,024 | 623,694 | 29,994,985 | 639,796 | 28,703,736 | 673,982 |
| Landed in 1936, fresh | 17,326,312 | 690,979 | 18,552,406 | 837,084 | 34,482,578 | 1,074,111 | 32,238,796 | 767,108 | 31,214,833 | 672,344 | 32,564,840 | 770,355 | 32,227,231 | 838,795 |

NOTE.—The weights of fresh and salted fish given in these statistics represent the fish as landed from the vessels, and the values are those received by the fishermen. Large cod are classified as those weighing over 10 pounds; market cod, 2½ to 10 pounds; and scrod cod, 1 to 2½ pounds. Large haddock are those weighing over 2½ pounds and scrod haddock, 1 to 2½ pounds. Large hake are those weighing over 6 pounds and small hake, under 6 pounds. Only landings by vessels having a capacity of 5 net tons or greater are used in this tabulation. Prior to Jan. 1, 1937, statistics were not collected separately on the individual species of flounders.

*Landings by fishing vessels at the three principal New England ports, 1937*—Continued

BOSTON: By months—Continued

| Species | August | | September | | October | | November | | December | | Total, 1937 | | Total, 1936 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod, fresh: | | | | | | | | | | | | | | |
| Large | 1, 146, 955 | $42, 763 | 1, 066, 345 | $44, 331 | 2, 005, 830 | $73, 670 | 2, 602, 425 | $72, 626 | 1, 971, 780 | $58, 356 | 29, 337, 085 | $801, 135 | 29, 516, 328 | $911, 858 |
| Market | 5, 147, 325 | 90, 195 | 3, 802, 445 | 92, 083 | 5, 049, 965 | 135, 003 | 5, 061, 485 | 119, 757 | 3, 105, 110 | 79, 595 | 53, 595, 693 | 1, 078, 298 | 35, 923, 029 | 955, 794 |
| Scrod | 149, 365 | 1, 983 | 181, 400 | 3, 053 | 211, 350 | 4, 130 | 418, 650 | 7, 308 | 340, 205 | 6, 440 | 2, 944, 710 | 46, 513 | 4, 415, 985 | 90, 523 |
| Cod, salted: | | | | | | | | | | | | | | |
| Large | ---- | ---- | ---- | ---- | 6, 000 | 255 | ---- | ---- | ---- | ---- | 6, 000 | 255 | 1, 020 | 33 |
| Market | ---- | ---- | ---- | ---- | 400 | 14 | ---- | ---- | ---- | ---- | 400 | 14 | 135 | 3 |
| Haddock, fresh: | | | | | | | | | | | | | | |
| Large | 6, 939, 455 | 201, 235 | 6, 758, 540 | 226, 563 | 5, 513, 735 | 229, 531 | 4, 646, 980 | 211, 308 | 4, 568, 880 | 212, 367 | 96, 818, 320 | 2, 889, 068 | 97, 592, 853 | 3, 306, 586 |
| Scrod | 4, 583, 265 | 98, 115 | 5, 603, 095 | 133, 999 | 4, 024, 680 | 107, 964 | 1, 461, 967 | 45, 934 | 807, 650 | 28, 481 | 33, 103, 115 | 762, 164 | 38, 171, 456 | 937, 613 |
| Hake, fresh: | | | | | | | | | | | | | | |
| Large | 605, 009 | 10, 970 | 645, 925 | 12, 978 | 954, 770 | 20, 635 | 1, 207, 390 | 24, 118 | 897, 675 | 23, 528 | 8, 111, 045 | 184, 814 | 7, 997, 861 | 229, 838 |
| Small | 181, 250 | 4, 328 | 176, 200 | 3, 826 | 383, 350 | 8, 260 | 236, 000 | 5, 178 | 88, 100 | 2, 086 | 1, 614, 385 | 35, 800 | 794, 610 | 24, 157 |
| Hake, salted, large | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 75 | 1 |
| Pollock, fresh | 653, 690 | 12, 699 | 550, 535 | 11, 855 | 1, 275, 240 | 24, 472 | 4, 539, 895 | 82, 646 | 2, 621, 975 | 45, 027 | 16. 857, 310 | 310, 518 | 14, 159, 809 | 335, 768 |
| Cusk, fresh | 509, 720 | 7, 579 | 595, 445 | 11, 750 | 594, 030 | 13, 931 | 510, 280 | 11, 931 | 500, 490 | 11, 159 | 5, 555, 782 | 114, 915 | 5, 800, 667 | 132, 083 |
| Halibut, fresh | 209, 587 | 28, 297 | 132, 248 | 17, 926 | 82, 271 | 11, 917 | 25, 814 | 4, 838 | 14, 917 | 3, 148 | 1, 937, 638 | 236, 684 | 2, 059, 883 | 218, 067 |
| Mackerel, fresh | 319, 785 | 23, 553 | 347, 678 | 23, 043 | 626, 050 | 46, 569 | 960, 040 | 78, 769 | 504, 570 | 37, 519 | 7, 485, 218 | 377, 251 | 21, 012, 706 | 595, 073 |
| Mackerel, salted | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 865 | 24 |
| Flounders, fresh: | | | | | | | | | | | | | | |
| Gray sole | 365, 605 | 19, 083 | 267, 505 | 15, 794 | 395, 255 | 23, 533 | 406, 875 | 20, 195 | 297, 825 | 15, 775 | 6, 561, 939 | 268, 277 | 13, 880, 564 | 554, 429 |
| Lemon sole | 96, 745 | 8, 007 | 193, 233 | 14, 516 | 272, 739 | 16, 344 | 177, 015 | 14, 023 | 125, 475 | 10, 999 | 2, 436, 399 | 150, 968 | | |
| Yellowtail | 359, 990 | 10, 228 | 358, 205 | 8, 223 | 244, 370 | 6, 168 | 559, 400 | 9, 618 | 475, 015 | 10, 497 | 3, 852, 180 | 86, 702 | | |
| Blackback | 71, 855 | 3, 086 | 180, 938 | 6, 723 | 53, 590 | 2, 322 | 167, 027 | 5, 757 | 109, 095 | 3, 563 | 1, 032, 290 | 37, 959 | | |
| Dab | 103, 440 | 3, 399 | 136, 700 | 3, 703 | 158, 435 | 4, 954 | 169, 805 | 3, 459 | 75, 425 | 1, 745 | 2, 081, 135 | 44, 401 | | |
| Other | 7, 605 | 367 | 21, 129 | 1, 066 | 16, 935 | 808 | 25, 790 | 1, 249 | 14, 920 | 615 | 715, 639 | 21, 220 | | |
| Swordfish, fresh | 395, 133 | 81, 326 | 164, 913 | 39, 078 | ---- | ---- | ---- | ---- | ---- | ---- | 1, 090, 618 | 225, 569 | 1, 195, 520 | 251, 655 |
| Whiting, fresh | 555, 925 | 6, 278 | 954. 780 | 17, 208 | 1, 352, 119 | 31, 415 | 320. 110 | 8, 620 | 23, 450 | 506 | 6, 213, 064 | 100, 192 | 14, 902, 353 | 253, 385 |
| Wolffish, fresh | 64, 581 | 2, 348 | 24, 490 | 897 | 46, 345 | 1, 968 | 37, 820 | 1, 506 | 59, 080 | 1, 898 | 1, 838, 906 | 42, 751 | 1, 920, 081 | 46, 755 |
| Rosefish, fresh | 4, 692, 434 | 63, 703 | 4, 262, 094 | 64, 032 | 4, 968, 292 | 102, 549 | 5, 779, 297 | 114, 691 | 6, 270, 355 | 108, 043 | 41, 175, 252 | 641, 011 | 49, 419, 014 | 720, 231 |
| Herring, fresh | ---- | ---- | 1, 400 | 18 | ---- | ---- | ---- | ---- | ---- | ---- | 1, 400 | 18 | 400 | 6 |
| Other, fresh | 65, 752 | 4, 021 | 48, 928 | 2, 089 | 56, 105 | 2, 893 | 18, 205 | 967 | 6, 286 | 399 | 234, 004 | 11, 488 | 398, 275 | 19, 351 |
| Total, fresh | 27, 224, 462 | 723, 563 | 26, 474, 171 | 754, 754 | 28, 285, 456 | 869, 036 | 29, 335, 270 | 844, 498 | 22, 878, 278 | 661, 746 | 324, 593, 127 | 8, 467, 716 | 339, 161, 394 | 9, 583, 172 |
| Total, salted | ---- | ---- | ---- | ---- | 6, 400 | 269 | ---- | ---- | ---- | ---- | 6, 400 | 269 | 2, 095 | 61 |
| Grand total | 27, 224, 462 | 723, 563 | 26, 474, 171 | 754, 754 | 28, 291, 856 | 869, 305 | 29, 335, 270 | 844, 498 | 22, 878, 278 | 661, 746 | 324, 599, 527 | 8, 467, 985 | 339, 163, 489 | 9, 583, 233 |
| Landed in 1936: | | | | | | | | | | | | | | |
| Fresh | 29, 942, 393 | 811, 528 | 31, 138. 927 | 872, 835 | 28, 010, 116 | 813, 778 | 26, 718, 676 | 763, 955 | 24, 744, 286 | 670, 300 | ---- | ---- | 339, 161, 394 | 9, 583, 172 |
| Salted | 865 | 24 | ---- | ---- | 1, 230 | 37 | ---- | ---- | ---- | ---- | ---- | ---- | 2, 095 | 61 |
| Total | 29, 943, 258 | 811, 552 | 31, 138, 927 | 872, 835 | 28, 011, 346 | 813, 815 | 26, 718, 676 | 763, 955 | 24, 744, 286 | 670, 300 | ---- | ---- | 339, 163, 489 | 9, 583, 233 |

## GLOUCESTER: By months

| Species | January | | February | | March | | April | | May | | June | | July | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod, fresh: | | | | | | | | | | | | | | |
| Large | 73,185 | $3,230 | 78,750 | $2,853 | 92,890 | $3,364 | 620,675 | $14,027 | 602,795 | $15,035 | 323,235 | $8,679 | 239,590 | $5,062 |
| Market | 113,960 | 3,093 | 80,505 | 2,241 | 123,225 | 3,027 | 620,325 | 10,566 | 434,393 | 7,222 | 337,060 | 4,828 | 443,015 | 5,993 |
| Scrod | 9,350 | 171 | 9,830 | 171 | 8,660 | 164 | 41,810 | 722 | 21,040 | 240 | 10,780 | 102 | 8,915 | 93 |
| Cod, salted: | | | | | | | | | | | | | | |
| Large | 73,123 | 2,925 | | | 15,235 | 502 | 30,720 | 922 | 10,025 | 301 | 32,100 | 970 | 317,745 | 10,373 |
| Market | 101,231 | 3,037 | | | 62,520 | 1,867 | 3,135 | 63 | 3,000 | 59 | 12,535 | 257 | 7,440 | 160 |
| Scrod | 28,000 | 700 | | | 628 | 13 | | | | | | | | |
| Haddock, fresh: | | | | | | | | | | | | | | |
| Large | 64,600 | 2,459 | 48,465 | 1,890 | 183,820 | 4,646 | 379,367 | 7,164 | 186,996 | 3,861 | 439,300 | 10,017 | 307,230 | 7,665 |
| Scrod | 6,015 | 120 | 10,290 | 174 | 22,130 | 500 | 43,075 | 753 | 58,185 | 1,221 | 257,335 | 5,020 | 82,480 | 1,497 |
| Hake, fresh: | | | | | | | | | | | | | | |
| Large | 56,930 | 1,568 | 29,535 | 874 | 12,340 | 252 | 7,260 | 120 | 126,995 | 1,194 | 78,850 | 858 | 224,570 | 2,340 |
| Small | 25,180 | 567 | 5,230 | 85 | 3,095 | 49 | | | 1,470 | 19 | 8,910 | 82 | 5,470 | 49 |
| Hake, salted, large | | | | | 1,973 | 30 | | | | | | | 2,560 | 51 |
| Pollock: | | | | | | | | | | | | | | |
| Fresh | 418,665 | 8,099 | 15,275 | 259 | 20,150 | 433 | 80,995 | 1,191 | 32,060 | 483 | 53,589 | 829 | 598,675 | 8,286 |
| Salted | 1,330 | 27 | | | | | | | | | 130 | 2 | 470 | 7 |
| Cusk, fresh | 8,465 | 230 | 6,620 | 163 | 2,325 | 45 | 58,025 | 730 | 16,600 | 197 | 24,958 | 300 | 99,435 | 1,338 |
| Halibut, fresh | 696 | 176 | 90 | 15 | 8 | 1 | 1,837 | 139 | 1,864 | 152 | 25,098 | 1,278 | 1,089 | 71 |
| Mackerel, fresh | | | | | | | | | 58,930 | 1,264 | 47,754 | 1,869 | 269,425 | 9,215 |
| Flounders, fresh: | | | | | | | | | | | | | | |
| Gray sole | 100,605 | 3,932 | 104,150 | 5,524 | 93,445 | 3,336 | 15,570 | 693 | 29,575 | 769 | 50,943 | 1,364 | 81,145 | 2,249 |
| Lemon sole | 710 | 28 | | | 100 | 2 | | | | | 10,540 | 251 | 655 | 14 |
| Yellowtail | 6,250 | 171 | 6,850 | 208 | 455 | 10 | 880 | 22 | 11,080 | 276 | 765 | 14 | 255 | 5 |
| Blackback | 9,920 | 351 | 5,675 | 303 | 3,615 | 161 | 580 | 21 | 520 | 14 | 170 | 5 | | |
| Dab | 20,985 | 351 | 21,640 | 640 | 17,040 | 357 | 20,080 | 361 | 15,735 | 196 | 14,149 | 138 | 20,130 | 215 |
| Other | | | | | | | 215 | 2 | 355 | 6 | | | | |
| Swordfish, fresh | | | | | | | | | | | 1,355 | 451 | 3,870 | 657 |
| Whiting, fresh | 6,845 | 199 | 795 | 27 | 420 | 17 | 605 | 12 | 8,419 | 78 | 9,335 | 86 | 5,346 | 59 |
| Wolffish, fresh | 2,170 | 55 | 2,585 | 69 | 7,815 | 178 | 48,805 | 697 | 15,835 | 230 | 9,660 | 147 | 6,045 | 99 |
| Rosefish, fresh | 360,375 | 4,094 | 286,795 | 2,884 | 126,100 | 1,349 | 8,280 | 133 | 1,860,375 | 22,133 | 2,914,540 | 31,750 | 2,227,185 | 28,748 |
| Other, fresh | 5,230 | 84 | 3,710 | 60 | 1,990 | 34 | 540 | 10 | 1,709 | 72 | 4,626 | 112 | 48,496 | 2,098 |
| Total, fresh | 1,290,136 | 28,978 | 716,790 | 18,440 | 719,623 | 17,925 | 1,948,924 | 37,363 | 3,484,931 | 54,662 | 4,622,952 | 68,180 | 4,673,021 | 75,753 |
| Total, salted | 203,684 | 6,689 | | | 80,356 | 2,412 | 33,855 | 985 | 13,025 | 360 | 41,765 | 1,229 | 328,215 | 10,591 |
| Grand total | 1,493,820 | 35,667 | 716,790 | 18,440 | 799,979 | 20,337 | 1,982,779 | 38,348 | 3,497,956 | 55,022 | 4,667,717 | 69,409 | 5,001,236 | 86,344 |
| Landed in 1936: | | | | | | | | | | | | | | |
| Fresh | 969,795 | 32,185 | 279,499 | 11,994 | 2,200,560 | 60,509 | 3,154,800 | 69,798 | 4,848,209 | 86,340 | 4,827,771 | 85,760 | 4,406,325 | 75,520 |
| Frozen | | | | | 276,690 | 5,534 | | | | | | | | |
| Salted | 247,104 | 7,621 | | | 182,505 | 5,666 | 46,195 | 1,226 | 185,535 | 5,320 | 116,355 | 2,624 | 552,526 | 18,192 |
| Total | 1,216,899 | 39,809 | 279,499 | 11,994 | 2,659,755 | 71,709 | 3,200,995 | 71,024 | 5,033,744 | 91,660 | 4,911,126 | 88,384 | 4,958,851 | 93,712 |

*Landings by fishing vessels at the three principal New England ports, 1937*—Continued

GLOUCESTER: BY MONTHS—Continued

| Species | August | | September | | October | | November | | December | | Total, 1937 | | Total, 1936 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod, fresh: | | | | | | | | | | | | | | |
| Large | 158,615 | $5,464 | 221,301 | $9,856 | 218,040 | $9,011 | 660,942 | $16,949 | 325,545 | $9,449 | 3,615,563 | $102,979 | 4,870,209 | $137,250 |
| Market | 268,545 | 4,302 | 264,135 | 5,519 | 460,821 | 11,141 | 829,640 | 18,204 | 434,662 | 9,457 | 4,410,286 | 85,593 | 1,683,419 | 38,682 |
| Scrod | 10,495 | 132 | 390 | 5 | 1,775 | 25 | 21,230 | 382 | 40,670 | 724 | 184,945 | 2,931 | 245,052 | 5,306 |
| Cod, salted: | | | | | | | | | | | | | | |
| Large | 352,040 | 11,394 | 84,320 | 2,517 | 5,950 | 164 | | | 1,835 | 87 | 923,093 | 30,155 | 907,151 | 30,498 |
| Market | 6,005 | 131 | 4,990 | 125 | 126,285 | 4,035 | | | 160 | 5 | 327,301 | 9,739 | 443,757 | 12,710 |
| Scrod | | | | | | | | | | | 28,628 | 713 | 84,598 | 1,693 |
| Haddock, fresh: | | | | | | | | | | | | | | |
| Large | 374,353 | 9,860 | 197,783 | 6,053 | 331,925 | 13,057 | 271,360 | 9,290 | 371,902 | 6,632 | 3,157,101 | 82,594 | 3,128,911 | 89,363 |
| Scrod | 125,570 | 2,613 | 98,085 | 2,290 | 251,520 | 6,217 | 65,780 | 1,362 | 29,150 | 792 | 1,049,615 | 22,559 | 845,602 | 19,642 |
| Haddock, salted, large | | | | | | | | | | | | | 2,510 | 50 |
| Hake, fresh: | | | | | | | | | | | | | | |
| Large | 164 285 | 2,192 | 290,530 | 4,388 | 394,133 | 6,486 | 224,688 | 4,049 | 122,912 | 2,594 | 1,733,028 | 26,915 | 701,062 | 15,425 |
| Small | 1,655 | 16 | 7,475 | 81 | 21,405 | 225 | 8,670 | 102 | 22,462 | 369 | 111,022 | 1,644 | 49,415 | 916 |
| Hake, salted, large | | | 1,200 | 18 | 680 | 14 | | | | | 6,413 | 113 | 2,720 | 48 |
| Pollock, fresh | 859,705 | 13,567 | 650,824 | 11,112 | 1,055,548 | 16,547 | 3,692,629 | 55,570 | 2,136,834 | 28,719 | 9,614,949 | 145,095 | 17,145,965 | 280,339 |
| Pollock, salted | 40 | 1 | 160 | 2 | | | | | | | 2,130 | 39 | 860 | 10 |
| Cusk, fresh | 39,470 | 479 | 11,135 | 198 | 2,300 | 36 | 5,450 | 99 | 25,695 | 458 | 300,478 | 4,273 | 151,341 | 2,824 |
| Cusk, salted | | | 400 | 8 | | | | | | | 400 | 8 | 5,000 | 88 |
| Halibut, fresh | 463 | 61 | 235 | 26 | 193 | 34 | 2,039 | 236 | 6,821 | 1,165 | 40,433 | 3,354 | 26,751 | 2,116 |
| Halibut, salted | | | | | | | | | | | | | 15,895 | 892 |
| Mackerel, fresh | 94,670 | 6,440 | 78,695 | 4,758 | 59,468 | 5,008 | 420,878 | 27,341 | 232,343 | 15,866 | 1,262,163 | 71,761 | 7,103,273 | 174,353 |
| Mackerel, salted | 67,600 | 4,500 | 119,800 | 7,188 | 63,770 | 3,825 | | | | | 251,170 | 15,513 | 289,622 | 9,381 |
| Flounders, fresh: | | | | | | | | | | | | | | |
| Gray sole | 63,565 | 2,163 | 62,250 | 2,608 | 55,750 | 2,844 | 125,480 | 4,532 | 65,275 | 2,462 | 847,753 | 32,476 | 837,065 | 29,657 |
| Lemon sole | | | 11,475 | 772 | 4,560 | 178 | 210 | 9 | 910 | 38 | 29,190 | 1,292 | | |
| Yellowtail | 8,560 | 160 | 81,970 | 1,551 | 5,965 | 118 | 82,495 | 1,369 | 31,610 | 467 | 237,135 | 4,371 | | |
| Blackback | 165 | 6 | 1,575 | 42 | 7,255 | 223 | 1,840 | 47 | 1,425 | 41 | 32,740 | 1,214 | | |
| Dab | 17,210 | 243 | 21,295 | 266 | 32,645 | 619 | 65,500 | 931 | 34,359 | 502 | 300,768 | 4,819 | | |
| Other | | | 6,165 | 495 | 1,525 | 148 | 50 | 5 | | | 8,310 | 656 | | |
| Swordfish, fresh | 5,501 | 849 | 459 | 103 | | | | | | | 11,185 | 2,060 | 1,486 | 439 |
| Whiting, fresh | 17,221 | 224 | 9,295 | 136 | 228,321 | 5,389 | 37,006 | 893 | 2,045 | 54 | 325,653 | 7,174 | 2,619,800 | 41,893 |
| Wolffish, fresh | 3,680 | 62 | 495 | 10 | 1,520 | 27 | 1,805 | 42 | 2,000 | 47 | 102,415 | 1,663 | 68,405 | 1,385 |
| Rosefish, fresh | 2,307,086 | 29,676 | 1,254,777 | 18,698 | 1,134,813 | 23,303 | 2,530,794 | 47,962 | 2,011,620 | 35,002 | 17,022,740 | 245,732 | 17,093,898 | 242,636 |
| Herring, fresh | | | 3,475 | 33 | 1,400 | 12 | | | | | 4,875 | 45 | 1,750 | 16 |
| Herring, frozen | | | | | | | | | | | | | 276,690 | 5,534 |
| Herring, salted | | | | | | | | | | | | | 321,804 | 9,678 |
| Other, fresh | 109,489 | 4,380 | 48,778 | 899 | 46,717 | 1,728 | 23,602 | 926 | 2,602 | 125 | 297,489 | 10,528 | 291,102 | 5,420 |
| Total, fresh | 4,630,303 | 82,889 | 3,322,597 | 69,899 | 4,317,599 | 102,376 | 9,072,088 | 190,300 | 5,900,872 | 114,963 | 44,699,836 | 861,728 | 56,864,506 | 1,087,662 |
| Total, frozen | | | | | | | | | | | | | 276,690 | 5,534 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total, salted | 425,685 | 16,026 | 210,870 | 9,858 | 196,685 | 8,038 | ---------- | -------- | 1,995 | 92 | 1,539,135 | 56,280 | 2,073,917 | 65,048 |
| Grand total | 5,055,988 | 98,915 | 3,533,467 | 79,757 | 4,514,284 | 110,414 | 9,072,088 | 190,300 | 5,902,867 | 115,055 | 46,238,971 | 918,008 | 59,215,113 | 1,158,244 |
| Landed in 1936: | | | | | | | | | | | | | | |
| Fresh | 6,285,312 | 110,355 | 5,818,793 | 120,525 | 7,887,260 | 156,589 | 9,757,427 | 161,237 | 6,428,755 | 116,850 | ---------- | -------- | 56,864,506 | 1,087,662 |
| Frozen | ---------- | -------- | ---------- | -------- | ---------- | -------- | ---------- | -------- | ---------- | -------- | ---------- | -------- | 276,690 | 5,534 |
| Salted | 252,418 | 8,563 | 246,407 | 8,240 | 244,872 | 7,593 | ---------- | -------- | ---------- | -------- | ---------- | -------- | 2,073,917 | 65,048 |
| Total | 6,537,730 | 118,918 | 6,065,200 | 128,765 | 8,132,132 | 164,182 | 9,757 427 | 161,237 | 6,428,755 | 116,850 | ---------- | -------- | 59,215,113 | 1,158,244 |

PORTLAND: BY MONTHS

| Species | January | | February | | March | | April | | May | | June | | July | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod, fresh: | | | | | | | | | | | | | | |
| Large | 79,195 | $3,189 | 67,960 | $2,204 | 77,450 | $2,475 | 573,762 | $12,146 | 572,541 | $11,816 | 287,290 | $8,470 | 343,877 | $10,208 |
| Market | 74,975 | 2,237 | 83,818 | 2,120 | 106,069 | 2,367 | 980,218 | 17,856 | 1,355,294 | 24,710 | 65,186 | 1,062 | 10,908 | 165 |
| Scrod | 2,085 | 22 | 3,865 | 71 | 1,723 | 27 | 2,195 | 23 | 1,225 | 11 | 1,420 | 11 | 890 | 10 |
| Haddock, fresh: | | | | | | | | | | | | | | |
| Large | 196,221 | 9,825 | 163,893 | 6,299 | 159,279 | 5,938 | 1,159,294 | 23,034 | 604,953 | 12,729 | 80,914 | 3,030 | 48,720 | 2,304 |
| Scrod | 4,645 | 106 | 8,120 | 167 | 2,370 | 35 | 45,265 | 825 | 15,205 | 263 | 4,830 | 52 | 1,540 | 28 |
| Hake, fresh: | | | | | | | | | | | | | | |
| Large | 178,708 | 6,265 | 133,383 | 4,970 | 108,273 | 3,549 | 113,035 | 2,760 | 303,586 | 4,162 | 291,270 | 3,962 | 205,153 | 2,879 |
| Small | 2,705 | 65 | 80 | 1 | 300 | 7 | 3,975 | 66 | 10,340 | 93 | 28,760 | 290 | 27,820 | 259 |
| Pollock, fresh | 108,590 | 1,821 | 37,036 | 550 | 67,044 | 998 | 324,225 | 3,452 | 210,799 | 2,134 | 141,036 | 1,524 | 80,090 | 826 |
| Cusk, fresh | 295,505 | 8,382 | 379,770 | 9,702 | 374,583 | 8,192 | 282,44[illegible] | 4,862 | 107,686 | 2,328 | 57,926 | 1,133 | 80,270 | 1,546 |
| Halibut, fresh | 1,570 | 294 | 4,142 | 759 | 4,303 | 699 | 9,328 | 786 | 3,879 | 446 | 1,062 | 168 | 168 | 26 |
| Mackerel, fresh | ---------- | -------- | ---------- | -------- | ---------- | -------- | ---------- | -------- | ---------- | -------- | 73,435 | 2,651 | 108,014 | 3,786 |
| Flounders, fresh: | | | | | | | | | | | | | | |
| Gray sole | 4,875 | 204 | 25,585 | 1,028 | 21,240 | 686 | 51,045 | 1,909 | 56,210 | 1,742 | 107,613 | 2,785 | 105,953 | 3,003 |
| Lemon sole | 300 | 15 | ---------- | -------- | ---------- | -------- | 20 | 1 | ---------- | -------- | ---------- | -------- | ---------- | -------- |
| Yellowtail | 11,510 | 235 | ---------- | -------- | ---------- | -------- | 4,000 | 40 | 17,550 | 99 | 4,210 | 51 | 2,845 | 57 |
| Blackback | 1,715 | 67 | ---------- | -------- | 12,325 | 378 | 7,280 | 211 | 5,387 | 115 | 4,849 | 43 | 2,952 | 51 |
| Dab | 1,015 | 18 | 2,460 | 53 | 11,100 | 189 | 56,525 | 740 | 82,304 | 639 | 13,232 | 110 | 7,295 | 127 |
| Other | ---------- | -------- | ---------- | -------- | ---------- | -------- | 55 | -------- | ---------- | -------- | 10 | -------- | ---------- | -------- |
| Wolffish, fresh | 300 | 3 | 721 | 6 | 2,625 | 27 | 38,073 | 395 | 9,997 | 94 | 5,972 | 42 | 2,892 | 26 |
| Rosefish, fresh | 4,368 | 50 | 27,955 | 159 | 39,255 | 192 | 4,390 | 18 | 13,990 | 80 | 22,535 | 112 | 1,511 | 13 |
| Herring, fresh | ---------- | -------- | ---------- | -------- | ---------- | -------- | ---------- | -------- | ---------- | -------- | 237 | 2 | ---------- | -------- |
| Other, fresh | 1,457 | 29 | 473 | 38 | 7,118 | 493 | 1,153 | 53 | 3,315 | 88 | 4,915 | 117 | 6,526 | 134 |
| Total | 969,739 | 32,827 | 939,261 | 28,127 | 995,057 | 26,252 | 3,656,284 | 69,177 | 3,374,261 | 61,549 | 1,196,702 | 25,615 | 1,037,424 | 25,448 |
| Landed in 1936, fresh | 436,421 | 16,574 | 630,700 | 25,146 | 759,190 | 21,775 | 2,145,191 | 42,455 | 3,122,037 | 56,888 | 2,429,226 | 50,965 | 1,150,712 | 28,893 |

*Landings by fishing vessels at the three principal New England ports, 1937*—Continued

PORTLAND: BY MONTHS—Continued

| Species | August | | September | | October | | November | | December | | Total, 1937 | | Total, 1936 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod, fresh: | | | | | | | | | | | | | | |
| Large | 301, 145 | $14, 178 | 238, 558 | $10, 891 | 134, 627 | $6, 032 | 98, 275 | $3, 754 | 43, 435 | $1, 596 | 2, 821, 115 | $86, 962 | 2, 149, 330 | $60, 884 |
| Market | 32, 225 | 614 | 55, 755 | 1, 090 | 110, 910 | 2, 440 | 88, 135 | 1, 907 | 35, 637 | 888 | 2, 999, 130 | 57, 456 | 1, 130, 639 | 23, 359 |
| Scrod | 1, 931 | 32 | 200 | 2 | 900 | 10 | 2, 430 | 24 | 2, 335 | 42 | 21, 199 | 285 | 4, 585 | 56 |
| Cod, salted, large | | | | | | | | | | | | | 5, 180 | 168 |
| Haddock, fresh: | | | | | | | | | | | | | | |
| Large | 84, 284 | 3, 803 | 71, 331 | 3, 486 | 113, 414 | 5, 837 | 171, 530 | 8, 595 | 79, 915 | 4, 235 | 2, 933, 748 | 89, 115 | 3, 636, 769 | 98, 100 |
| Scrod | 2, 635 | 48 | 1, 225 | 21 | 5, 160 | 106 | 13, 130 | 223 | 9, 245 | 231 | 113, 370 | 2, 105 | 503, 159 | 9, 369 |
| Hake, fresh: | | | | | | | | | | | | | | |
| Large | 195, 991 | 3, 263 | 262, 573 | 4, 977 | 324, 232 | 7, 078 | 214, 695 | 4, 604 | 68, 012 | 1, 663 | 2, 398, 911 | 50, 132 | 2, 314, 592 | 53, 181 |
| Small | 20, 910 | 203 | 20, 945 | 349 | 43, 625 | 746 | 20, 730 | 488 | 42, 845 | 1, 225 | 223, 035 | 3, 792 | 74, 469 | 1, 023 |
| Hake, salted, large | | | | | | | | | | | | | 2, 030 | 20 |
| Pollock, fresh | 110, 965 | 1, 169 | 267, 569 | 2, 800 | 308, 540 | 3, 661 | 304, 535 | 4, 290 | 237, 672 | 3, 319 | 2, 198, 101 | 26, 544 | 3, 100, 022 | 49, 262 |
| Cusk: | | | | | | | | | | | | | | |
| Fresh | 90, 040 | 1, 662 | 48, 008 | 998 | 238, 561 | 5, 215 | 154, 572 | 3, 665 | 60, 650 | 1, 495 | 2, 170, 017 | 49, 180 | 1, 308, 530 | 33, 414 |
| Salted | | | | | | | | | | | | | 4, 500 | 72 |
| Halibut, fresh | 859 | 115 | 363 | 57 | 2, 078 | 280 | 2, 601 | 530 | 1, 939 | 361 | 32, 292 | 4, 521 | 95, 103 | 8, 558 |
| Mackerel, fresh | 27, 315 | 1, 642 | 7, 318 | 377 | 78 | 10 | | | | | 216, 160 | 8, 466 | 263, 942 | 10, 816 |
| Flounder, fresh: | | | | | | | | | | | | | | |
| Gray sole | 30, 771 | 1, 321 | 18, 274 | 965 | 2, 335 | 99 | 6, 020 | 295 | 6, 172 | 342 | 436, 093 | 14, 379 | 804, 816 | 18, 278 |
| Lemon sole | | | | | | | | | 15 | 2 | 335 | 18 | | |
| Yellowtail | 860 | 25 | 475 | 14 | | | 9, 965 | 152 | 2, 955 | 72 | 54, 370 | 745 | | |
| Blackback | 3, 731 | 97 | 995 | 30 | 180 | 2 | 1, 310 | 23 | 670 | 23 | 41, 394 | 1, 040 | | |
| Dab | 5, 190 | 95 | 4, 080 | 82 | 1, 115 | 28 | 1, 405 | 35 | 4, 645 | 89 | 190, 366 | 2, 205 | | |
| Other | | | | | | | | | 2, 765 | 138 | 2, 830 | 138 | | |
| Swordfish, fresh | 21, 760 | 3, 665 | 857 | 168 | | | | | | | 22, 617 | 3, 833 | 45, 704 | 8, 450 |
| Whiting, fresh | 10 | | | | | | | | 75 | 2 | 85 | 2 | 144, 780 | 2, 157 |
| Wolffish, fresh | 2, 111 | 27 | 65 | | 583 | 5 | 625 | 9 | 115 | 1 | 64, 079 | 635 | 57, 130 | 610 |
| Rosefish, fresh | 1, 240 | 10 | 1, 313 | 13 | 325 | 5 | 8, 585 | 121 | 3, 760 | 49 | 129, 227 | 822 | 78, 647 | 775 |
| Herring, fresh | | | | | | | | | | | 237 | 2 | 73, 340 | 574 |
| Other, fresh | 3, 844 | 94 | 15, 454 | 210 | 6, 157 | 170 | 1, 860 | 71 | 529 | 12 | 52, 801 | 1, 509 | 116, 318 | 1, 613 |
| Total, fresh | 940, 817 | 32, 063 | 1, 015, 358 | 26, 533 | 1, 292, 820 | 31, 724 | 1, 100, 403 | 28, 786 | 603, 386 | 15, 785 | 17, 121, 512 | 403, 886 | 15, 901, 875 | 380, 479 |
| Total, salted | | | | | | | | | | | | | 11, 710 | 260 |
| Grand total | 940, 817 | 32, 063 | 1, 015, 358 | 26, 533 | 1, 292, 820 | 31, 724 | 1, 100, 403 | 28, 786 | 603, 386 | 15, 785 | 17, 121, 512 | 403, 886 | 15, 913, 585 | 380, 739 |
| Landed in 1936: | | | | | | | | | | | | | | |
| Fresh | 1, 275, 154 | 33, 478 | 1, 456, 933 | 35, 165 | 1, 242, 169 | 30, 514 | 604, 718 | 18, 543 | 649, 424 | 20, 083 | | | 15, 901, 875 | 380, 479 |
| Salted | 11, 710 | 260 | | | | | | | | | | | 11, 710 | 260 |
| Total | 1, 286, 864 | 33, 738 | 1, 456, 933 | 35, 165 | 1, 242, 169 | 30, 514 | 604, 718 | 18, 543 | 649, 424 | 20, 083 | | | 15, 913, 585 | 380, 739 |

SUMMARY: BY PORTS

| Species | Boston |  | Gloucester |  | Portland |  | Total, 1937 |  | Total, 1936 |  |
|---|---|---|---|---|---|---|---|---|---|---|
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod, fresh: |  |  |  |  |  |  |  |  |  |  |
| Large | 29,337,085 | $801,135 | 3,615,563 | $102,979 | 2,821,115 | $86,962 | 35,773,763 | $991,076 | 36,535,867 | $1,109,992 |
| Market | 53,595,693 | 1,078,298 | 4,410,286 | 85,593 | 2,999,130 | 57,456 | 61,005,109 | 1,221,347 | 38,737,087 | 1,017,835 |
| Scrod | 2,944,710 | 46,513 | 184,945 | 2,931 | 21,199 | 285 | 3,150,854 | 49,729 | 4,665,622 | 95,885 |
| Cod, salted: |  |  |  |  |  |  |  |  |  |  |
| Large | 6,000 | 255 | 923,093 | 30,155 |  |  | 929,093 | 30,410 | 913,351 | 30,699 |
| Market | 400 | 14 | 327,301 | 9,739 |  |  | 327,701 | 9,753 | 443,892 | 12,713 |
| Scrod |  |  | 28,628 | 713 |  |  | 28,628 | 713 | 84,598 | 1,693 |
| Haddock, fresh: |  |  |  |  |  |  |  |  |  |  |
| Large | 96,818,320 | 2,889,068 | 3,157,101 | 82,594 | 2,933,748 | 89,115 | 102,909,169 | 3,060,777 | 104,358,533 | 3,494,049 |
| Scrod | 33,103,115 | 762,164 | 1,049,615 | 22,559 | 113,370 | 2,105 | 34,266,100 | 786,828 | 39,520,217 | 966,624 |
| Haddock, salted, large |  |  |  |  |  |  |  |  | 2,510 | 50 |
| Hake, fresh: |  |  |  |  |  |  |  |  |  |  |
| Large | 8,111,045 | 184,814 | 1,733,028 | 26,915 | 2,398,911 | 50,132 | 12,242,984 | 261,861 | 11,013,515 | 298,444 |
| Small | 1,614,385 | 35,800 | 111,022 | 1,644 | 223,035 | 3,792 | 1,948,442 | 41,236 | 918,494 | 26,096 |
| Hake, salted, large |  |  | 6,413 | 113 |  |  | 6,413 | 113 | 4,825 | 69 |
| Pollock, fresh | 16,857,310 | 310,518 | 9,614,949 | 145,095 | 2,198,101 | 26,544 | 28,670,360 | 482,157 | 34,405,796 | 665,369 |
| Pollock, salted |  |  | 2,130 | 39 |  |  | 2,130 | 39 | 860 | 10 |
| Cusk, fresh | 5,555,782 | 114,915 | 300,478 | 4,273 | 2,170,017 | 49,180 | 8,026,277 | 168,368 | 7,260,538 | 168,321 |
| Cusk, salted |  |  | 400 | 8 |  |  | 400 | 8 | 9,500 | 160 |
| Halibut, fresh | 1,937,638 | 236,684 | 40,433 | 3,354 | 32,292 | 4,521 | 2,010,363 | 244,559 | 2,181,737 | 228,741 |
| Halibut, salted |  |  |  |  |  |  |  |  | 15,895 | 892 |
| Mackerel, fresh | 7,485,218 | 377,251 | 1,262,163 | 71,761 | 216,160 | 8,466 | 8,963,541 | 457,478 | 28,379,921 | 780,242 |
| Mackerel, salted |  |  | 251,170 | 15,513 |  |  | 251,170 | 15,513 | 290,487 | 9,405 |
| Flounders, fresh: |  |  |  |  |  |  |  |  |  |  |
| Gray sole | 6,561,939 | 268,277 | 847,753 | 32,476 | 436,093 | 14,379 | 7,845,785 | 315,132 | 15,522,445 | 602,364 |
| Lemon sole | 2,436,399 | 150,968 | 29,190 | 1,292 | 335 | 18 | 2,465,924 | 152,278 |  |  |
| Yellowtail | 3,852,180 | 86,702 | 237,135 | 4,371 | 54,370 | 745 | 4,143,685 | 91,818 |  |  |
| Blackback | 1,032,290 | 37,959 | 32,740 | 1,214 | 41,394 | 1,040 | 1,106,424 | 40,213 |  |  |
| Dab | 2,081,135 | 44,401 | 300,768 | 4,819 | 190,366 | 2,205 | 2,572,269 | 51,425 |  |  |
| Other | 715,639 | 21,220 | 8,310 | 656 | 2,830 | 138 | 726,779 | 22,014 |  |  |
| Swordfish, fresh | 1,090,618 | 225,569 | 11,185 | 2,060 | 22,617 | 3,833 | 1,124,420 | 231,462 | 1,242,710 | 260,544 |
| Whiting, fresh | 6,213,064 | 100,192 | 325,653 | 7,174 | 85 | 2 | 6,538,802 | 107,368 | 17,666,933 | 297,435 |
| Wolffish, fresh | 1,838,906 | 42,751 | 102,415 | 1,663 | 64,079 | 635 | 2,005,400 | 45,049 | 2,045,616 | 48,750 |
| Rosefish, fresh | 41,175,252 | 641,011 | 17,022,740 | 245,732 | 129,227 | 822 | 58,327,219 | 887,565 | 66,591,559 | 963,642 |
| Herring, fresh | 1,400 | 18 | 4,875 | 45 | 237 | 2 | 6,512 | 65 | 75,490 | 596 |
| Herring, frozen |  |  |  |  |  |  |  |  | 276,690 | 5,534 |

*Landings by fishing vessels at the three principal New England ports, 1937*—Continued

SUMMARY: BY PORTS—Continued

| Species | Boston |  | Gloucester |  | Portland |  | Total, 1937 |  | 1936 |  |
|---|---|---|---|---|---|---|---|---|---|---|
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Herring, salted | - | - | - | - | - | - | - | - | 321,804 | $9,678 |
| Other, fresh | 234,004 | $11,488 | 297,489 | $10,528 | 52,801 | $1,509 | [1] 584,294 | [1] $23,525 | [2] 805,695 | [2] 26,384 |
| Total, fresh | 324,593,127 | 8,467,716 | 44,699,836 | 861,728 | 17,121,512 | 403,886 | 386,414,475 | 9,733,330 | 411,927,775 | 11,051,313 |
| Total, frozen | - | - | - | - | - | - | - | - | 276,690 | 5,534 |
| Total, salted | 6,400 | 269 | 1,539,135 | 56,280 | - | - | 1,545,535 | 56,549 | 2,087,722 | 65,369 |
| Grand total | 324,599,527 | 8,467,985 | 46,238,971 | 918,008 | 17,121,512 | 403,886 | 387,960,010 | 9,789,879 | 414,292,187 | 11,122,216 |
| Landed in 1936: |  |  |  |  |  |  |  |  |  |  |
| Fresh | 339,161,394 | 9,583,172 | 56,864,506 | 1,087,662 | 15,901,875 | 380,479 | - | - | 411,927,775 | 11,051,313 |
| Frozen | - | - | 276,690 | 5,534 | - | - | - | - | 276,690 | 5,534 |
| Salted | 2,095 | 61 | 2,073,917 | 65,048 | 11,710 | 260 | - | - | 2,087,722 | 65,369 |
| Total | 339,163,489 | 9,583,233 | 59,215,113 | 1,158,244 | 15,913,585 | 380,739 | - | - | 414,292,187 | 11,122,216 |

[1] The items under "Other, fresh" include albacore, 35 pounds, value $2; alewives, 109,415 pounds, value $1,120; butterfish, 122,831 pounds, value $6,901; cunner (perch) 320 pounds, value $11; eels, 1,790 pounds, value $45; goosefish, 16,525 pounds, value, $178; herring smelt, 10,645 pounds, value $191; salmon, 83 pounds, value $19; scup or porgy, 15,030 pounds, value $314; sea bass, 640 pounds, value $25; shad, 30,409 pounds, value $1,769; sharks, 65,356 pounds, value $1,865; skates, 34,822 pounds, value $460; striped bass, 28,185 pounds, value $2,536; sturgeon, 3,633 pounds, value $350; tautog, 700 pounds, value $27; tuna, 119,619 pounds, value $5,872; mixed fish, 8,106 pounds, value $127; lobsters, 251 pounds, value $60; scallops, 8,752 pounds, value $1,147; shrimp, 7,072 pounds, value $502; and squid, 75 pounds, value $1. The total for "Other, fresh" for 1937 does not represent the aggregate of "Other fresh" as recorded in the monthly bulletins throughout the year, since no livers, spawn, or tongues are included in the above table. These commodities were included in the monthly bulletins prior to May.

[2] Does not include the landings of livers, sounds, spawn, and tongues previously reported in this item.

NOTE.—In addition to the above the following also were landed during 1937: Livers, 2,920,873 pounds, value $65,669; spawn, 167,688 pounds, value $6,466; and tongues, 30 pounds, value $1.

## BIOLOGICAL ASPECT

In 1937 the fishing fleet landing fares at Boston and Gloucester, Mass., and Portland, Maine, and operating on the fishing banks of the North Atlantic, numbered 373 steam, motor, and sail vessels of 5 net tons capacity or greater, as measured by the United States Customs Service. The catch of edible fish landed at the three ports amounted to 389,228,243 pounds when the salted fish had been converted to the basis of fresh gutted or round fish as usually landed. This, bowever, does not represent the entire catch of edible fish of these vessels, for landings were also made at ports in New England other than these three, at New York City, and at more southern ports in connection with the southern winter trawl and mackerel fisheries.

Otter trawls on all sizes of vessels accounted for 316,631,906 pounds, or 81 percent of the total landings. Line trawls were next in importance, accounting for 44,006,603 pounds, or 11 percent of the total landings.

The catch taken off New England and landed at the three ports amounted to 237,283,835 pounds, or 61 percent of the total; that off Nova Scotia 146,965,720 pounds, or 38 percent; off the east coast of Newfoundland 3,818,780 pounds, or 1 percent; and that off the Middle Atlantic States 1,159,908 pounds, or less than one-half of 1 percent.

## *Landings by fishing vessels at the three principal New England ports, 1937*

### BY GEAR AND FISHING AREAS

| Gear and fishing areas | Vessels fishing | Trips | Days absent | Cod | | | Haddock | | Hake | | Pollock | Cusk | Halibut |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Large | Market | Scrod | Large | Scrod | Large | Small | | | |
| | *Number* | *Number* | *Number* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Line trawls: | | | | | | | | | | | | | |
| Treaty Coast | 2 | 2 | 207 | 138,934 | 314,767 | 56,683 | ----- | ----- | 3,749 | ----- | 2,527 | ----- | ----- |
| Magdalen Islands | 1 | 3 | 136 | 1,126,700 | 242,500 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Magdalen Island (occasional) | ----- | ----- | ----- | 95,000 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Gulf of St. Lawrence, unclassified | 5 | 7 | 140 | 39,779 | 25,751 | ----- | 6,700 | ----- | 149,075 | ----- | ----- | 11,255 | 104,181 |
| Grand Bank | 2 | 6 | 158 | 98,496 | 11,650 | ----- | ----- | ----- | 7,564 | ----- | ----- | ----- | 298,320 |
| Green Bank | 1 | 2 | 48 | 5,113 | 233 | ----- | ----- | ----- | 3,470 | ----- | ----- | 2,496 | 97,696 |
| St. Pierre Bank | 2 | 4 | 86 | 2,726 | 1,900 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 208,527 |
| Northeast Cape Breton | 2 | 4 | 55 | 7,521 | 3,776 | ----- | 20,255 | 165 | 11,200 | ----- | 855 | 35,300 | 55,609 |
| Banquereau | 4 | 10 | 229 | 126,698 | 26,954 | ----- | ----- | ----- | 84,002 | ----- | 3,800 | 14,449 | 242,948 |
| Middle Ground | 1 | 1 | 10 | 28,900 | 15,200 | ----- | 59,700 | ----- | ----- | ----- | 500 | ----- | 2,541 |
| Northeast Sable Island Bank | 3 | 3 | 21 | 21,783 | 6,471 | ----- | 3,720 | 420 | 24,740 | ----- | 370 | 22,140 | 30,052 |
| Southeast Sable Island Bank | 1 | 2 | 5 | 10,730 | 16,960 | ----- | ----- | 800 | 3,980 | ----- | 510 | 3,990 | 571 |
| Horseshoe Ground | 4 | 4 | 31 | 21,493 | 13,936 | ----- | 34,010 | 2,510 | 14,486 | ----- | 3,850 | 15,080 | 16,719 |
| Southwest Sable Island Bank | 5 | 5 | 32 | 47,720 | 48,130 | 1,700 | 101,060 | 5,910 | 6,930 | ----- | 10,165 | 1,200 | 2,539 |
| Eastern Nova Scotia | 2 | 2 | 20 | 28,060 | 24,530 | 3,100 | 31,055 | 180 | 39,640 | ----- | 725 | 16,750 | 693 |
| Emerald Bank | 7 | 12 | 109 | 81,810 | 87,260 | ----- | 385,420 | 28,390 | 97,630 | ----- | 15,465 | 143,385 | 23,484 |
| Central Nova Scotia | 2 | 2 | 17 | 12,650 | 5,000 | ----- | 380 | ----- | 36,380 | ----- | 802 | 23,680 | 30 |
| La Have Bank (including Sambro Bank) | 20 | 42 | 429 | 437,742 | 490,910 | 18,200 | 448,950 | 32,875 | 367,768 | ----- | 23,883 | 420,815 | 137,331 |
| Southern Nova Scotia | 17 | 46 | 380 | 307,825 | 425,385 | 28,240 | 841,095 | 86,845 | 215,028 | 525 | 100,846 | 347,417 | 9,958 |
| Browns Bank | 25 | 163 | 1,511 | 1,604,112 | 1,385,511 | 20,145 | 4,133,548 | 222,235 | 615,748 | 830 | 195,607 | 991,242 | 234,141 |
| Western Nova Scotia | 23 | 49 | 449 | 284,384 | 368,815 | 11,630 | 783,900 | 90,750 | 535,180 | ----- | 86,870 | 297,650 | 17,767 |
| Southern Bay of Fundy | 1 | 3 | 24 | 11,250 | 8,695 | ----- | 70,455 | 2,020 | 12,990 | ----- | 895 | 14,405 | 240 |
| Nova Scotia, unclassified | 8 | 12 | 159 | 134,560 | 90,930 | ----- | 118,570 | 5,240 | 147,440 | ----- | 9,955 | 134,080 | 7,546 |
| Eastern Maine | 2 | 4 | 48 | 8,450 | 6,580 | 480 | 23,295 | 1,260 | 7,050 | 6,900 | 4,540 | 6,220 | 1,480 |
| Central Maine | 18 | 160 | 1,214 | 150,033 | 120,540 | 4,425 | 116,184 | 3,180 | 1,248,890 | 48,955 | 78,083 | 838,912 | 2,874 |
| Western Maine | 14 | 162 | 209 | 34,545 | 17,560 | 1,915 | 54,430 | 1,710 | 102,936 | 19,290 | 10,160 | 61,674 | 1,117 |
| Eastern Massachusetts | 34 | 694 | 1,418 | 376,345 | 465,030 | 57,705 | 339,255 | 2,135 | 40,430 | 305,855 | 122,160 | 78,045 | 193 |
| Eastern Massachusetts (occasional) | ----- | ----- | ----- | 550 | 500 | 45 | ----- | ----- | 175 | ----- | 1,800 | 180 | ----- |
| Inner Grounds | 54 | 437 | 2,050 | 560,402 | 571,620 | 21,200 | 1,906,447 | 72,985 | 2,016,094 | 242,380 | 276,719 | 3,465,018 | 23,968 |
| Western Side South Channel | 16 | 66 | 411 | 414,395 | 443,620 | 2,060 | 1,678,250 | 72,220 | 248,465 | ----- | 127,995 | 146,590 | 11,651 |
| Eastern Side South Channel | 17 | 53 | 325 | 220,420 | 156,955 | 375 | 759,580 | 25,155 | 532,160 | 350 | 40,590 | 408,435 | 5,708 |
| Northern Edge of Georges | 8 | 17 | 96 | 254,647 | 170,175 | ----- | 235,235 | 4,240 | 76,855 | ----- | 25,175 | 60,355 | 9,314 |
| Northeast Peak of Georges | 4 | 5 | 38 | 119,380 | 50,160 | ----- | 62,900 | 2,600 | 29,880 | ----- | 5,894 | 18,450 | 1,033 |
| Lightship Grounds | 1 | 1 | 7 | 19,000 | 18,500 | ----- | 71,300 | 1,900 | 2,800 | ----- | 1,000 | ----- | 460 |
| Nantucket Shoals | 1 | 1 | 7 | 10,430 | 5,360 | ----- | 28,700 | 2,900 | ----- | ----- | 1,150 | ----- | 1,632 |
| Off No Mans Land | 3 | 3 | 21 | 8,400 | 9,750 | 200 | 27,900 | 4,800 | 5,500 | ----- | 3,200 | 22,575 | 708 |
| Southern New England, unclassified | 2 | 4 | 21 | 59,170 | 16,780 | ----- | 54,900 | 500 | 25,116 | ----- | 5,050 | 24,780 | 175 |
| Total | [1] 90 | 1,991 | 10,121 | 6,910,153 | 5,668,394 | 228,103 | 12,397,194 | 673,925 | 6,713,351 | 625,085 | 1,161,141 | 7,626,568 | 1,551,206 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hand lines: | | | | | | | | | | | | | |
| Central Maine (occasional) | | | | 215 | 365 | | | | 30 | | 700 | 125 | |
| Western Maine | 2 | 3 | 4 | 425 | 810 | | | | 65 | | 35 | | |
| Eastern Massachusetts | 7 | 7 | 20 | 3, 705 | 4, 035 | 25 | 25 | | 50 | | 815 | 30 | 9 |
| Eastern Massachusetts (occasional) | | | | | 690 | | | | | | | | |
| Western Side South Channel | 1 | 1 | 7 | 7, 500 | 4, 800 | | | | | | 1, 300 | | |
| Total | 10 | 11 | 31 | 11, 845 | 10, 700 | 25 | 25 | | 145 | | 2, 850 | 155 | 9 |
| Harpoons: | | | | | | | | | | | | | |
| Northeast Cape Breton | 15 | 15 | 288 | | | | | | | | | | |
| Banquereau | 1 | 1 | 28 | | | | | | | | | | |
| Northeast Sable Island Bank | 1 | 1 | 12 | | | | | | | | | | |
| Horseshoe Ground | 1 | 1 | 4 | | | | | | | | | | |
| La Have Bank (including Sambro Bank) | 1 | 1 | 5 | | | | | | | | | | |
| Browns Bank | 30 | 50 | 703 | | | | | | | | | | |
| Nova Scotia, unclassified | 2 | 2 | 31 | | | | | | | | | | |
| Western Maine | 1 | 5 | 5 | | | | | | | | | | |
| Eastern Massachusetts | 1 | 1 | 1 | | | | | | | | | | |
| Western Side South Channel | 1 | 1 | 12 | | | | | | | | | | |
| Eastern Side South Channel | 1 | 1 | 8 | | | | | | | | | | |
| Northern Edge of Georges | 11 | 14 | 155 | | | | | | | | | | |
| Northeast Peak of Georges | 20 | 23 | 191 | | | | | | | | | | |
| Southeast Georges | 9 | 11 | 145 | | | | | | | | | | |
| Southwest Georges | 15 | 18 | 278 | | | | | | | | | | |
| Lightship Grounds | 9 | 12 | 145 | | | | | | | | | | |
| Off No Mans Land | 3 | 3 | 31 | | | | | | | | | | |
| Southern New England, unclassified | 9 | 10 | 124 | | | | | | | | | | |
| South | 6 | 6 | 73 | | | | | | | | | | |
| Total | [1] 36 | 176 | 2, 239 | | | | | | | | | | |
| Otter trawls, large: | | | | | | | | | | | | | |
| Newfoundland Banks, unclassified | 3 | 4 | 32 | 62, 600 | 103, 700 | 9, 400 | 220, 300 | 18, 080 | 760 | | 2, 560 | 20 | 87 |
| Misaine Bank | 1 | 1 | 12 | 6, 500 | 22, 500 | 2, 700 | 81, 000 | 500 | 100 | | 100 | | 251 |
| Banquereau | 48 | 140 | 1, 441 | 2, 872, 209 | 12, 088, 010 | 1, 017, 816 | 3, 881, 991 | 774, 350 | 22, 075 | | 196, 230 | 777 | 46, 092 |
| Middle Ground | 37 | 76 | 625 | 948, 675 | 2, 221, 141 | 176, 815 | 2, 940, 770 | 166, 605 | 68, 535 | | 152, 215 | 8, 335 | 11, 312 |
| Northeast Sable Island Bank | 37 | 80 | 616 | 1, 156, 115 | 2, 650, 520 | 82, 535 | 2, 994, 375 | 296, 095 | 19, 820 | | 226, 957 | 8, 483 | 15, 282 |
| Southeast Sable Island Bank | 14 | 15 | 117 | 518, 625 | 833, 915 | 11, 600 | 351, 165 | 15, 340 | 11, 340 | | 57, 668 | 2, 815 | 11, 098 |
| Horseshoe Ground | 59 | 183 | 1, 511 | 3, 321, 778 | 3, 207, 747 | 93, 881 | 8, 638, 823 | 307, 405 | 242, 445 | | 1, 428, 851 | 33, 994 | 49, 064 |
| Southwest Sable Island Bank | 40 | 87 | 592 | 1, 462, 557 | 1, 624, 430 | 59, 235 | 3, 490, 393 | 304, 710 | 42, 437 | 190 | 372, 890 | 4, 433 | 28, 827 |
| Eastern Nova Scotia | 6 | 6 | 18 | 9, 690 | 26, 450 | 1, 300 | 114, 310 | 11, 920 | 5, 620 | | 5, 190 | 190 | 516 |
| Emerald Bank | 48 | 118 | 846 | 1, 258, 836 | 1, 212, 455 | 72, 443 | 5, 564, 202 | 406, 904 | 169, 230 | | 682, 815 | 20, 785 | 29, 297 |
| Central Nova Scotia | 2 | 2 | 7 | 1, 520 | 11, 800 | | 33, 960 | 22, 520 | 3, 680 | | 820 | 520 | 138 |
| La Have Bank (including Sambro Bank) | 6 | 8 | 31 | 34, 305 | 39, 745 | 2, 300 | 78, 080 | 27, 638 | 4, 595 | | 23, 050 | 100 | 495 |
| Southern Nova Scotia | 22 | 85 | 543 | 345, 271 | 223, 215 | 2, 620 | 204, 080 | 74, 430 | 59, 270 | | 166, 330 | 295 | 798 |
| Browns Bank | 52 | 253 | 1, 567 | 1, 306, 208 | 2, 134, 821 | 105, 355 | 6, 970, 155 | 1, 844, 528 | 161, 531 | 760 | 1, 512, 993 | 31, 355 | 33, 236 |
| Western Nova Scotia | 5 | 9 | 87 | 365, 662 | 507, 570 | 11, 160 | 155, 090 | 20, 315 | 10, 555 | | 236, 115 | 427 | 670 |

See footnotes at end of table.

*Landings by fishing vessels at the three principal New England ports, 1937*—Continued

BY GEAR AND FISHING AREAS—Continued

| Gear and fishing areas | Vessels fishing | Trips | Days absent | Cod | | | Haddock | | Hake | | Pollock | Cusk | Halibut |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Large | Market | Scrod | Large | Scrod | Large | Small | | | |
| | *Number* | *Number* | *Number* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Otter trawls, large—Continued. | | | | | | | | | | | | | |
| Nova Scotia, unclassified | 22 | 32 | 335 | 416,505 | 684,730 | 75,700 | 1,029,010 | 150,005 | 39,660 | | 191,265 | 4,370 | 10,031 |
| Eastern Massachusetts | 1 | 1 | 1 | | | | | | | | 11,830 | | |
| Inner Grounds | 3 | 4 | 18 | 2,300 | 1,980 | | 5,280 | | 320 | | 3,060 | 220 | 48 |
| Western Side South Channel | 44 | 199 | 1,263 | 612,383 | 952,160 | 36,065 | 3,769,765 | 1,704,265 | 345,240 | | 838,322 | 28,831 | 7,476 |
| Eastern Side South Channel | 52 | 190 | 1,054 | 623,349 | 840,645 | 22,670 | 3,467,117 | 1,217,444 | 372,648 | | 1,277,735 | 23,229 | 15,664 |
| Northern Edge of Georges | 58 | 420 | 2,620 | 2,447,834 | 9,086,219 | 404,895 | 11,301,360 | 7,201,024 | 305,823 | | 1,452,995 | 31,751 | 61,024 |
| Northeast Peak of Georges | 62 | 541 | 4,080 | 5,593,405 | 10,973,735 | 524,455 | 18,656,239 | 11,134,229 | 285,343 | | 3,018,361 | 69,937 | 81,009 |
| Central Georges | 34 | 75 | 404 | 338,750 | 786,515 | 25,300 | 1,657,070 | 1,057,494 | 26,860 | | 133,785 | 5,016 | 9,974 |
| Southeast Georges | 34 | 74 | 503 | 818,285 | 789,190 | 18,050 | 2,283,535 | 1,754,087 | 86,133 | | 275,730 | 4,722 | 12,538 |
| Southwest Georges | 6 | 7 | 22 | 17,970 | 32,850 | 940 | 71,670 | 47,920 | 6,490 | | 11,640 | | 298 |
| Lightship Grounds | 3 | 3 | 7 | 2,605 | 17,135 | | 14,020 | 12,495 | 185 | | 1,180 | 15 | 9 |
| Nantucket Shoals | 4 | 4 | 31 | 22,360 | 101,830 | 1,700 | 147,450 | 100,900 | 4,300 | | 8,110 | 600 | 120 |
| Southern New England, unclassified | 17 | 21 | 163 | 119,785 | 277,925 | 28,600 | 547,060 | 315,785 | 19,700 | | 92,228 | 3,950 | 3,393 |
| Total | [1] 70 | 2,638 | 18,546 | 24,686,082 | 51,452,933 | 2,787,535 | 78,668,270 | 28,986,988 | 2,314,695 | 950 | 12,411,025 | 285,170 | 428,747 |
| Otter trawls, medium: | | | | | | | | | | | | | |
| Southeast Sable Island Bank | 2 | 2 | 5 | 1,200 | 250 | | 900 | 125 | 3,190 | | 350 | | |
| Southern Nova Scotia | 27 | 106 | 840 | 163,648 | 111,042 | 7,885 | 98,828 | 34,800 | 64,358 | 6,505 | 34,094 | 3,965 | 153 |
| Browns Bank | 25 | 97 | 744 | 211,017 | 179,036 | 1,565 | 541,799 | 152,875 | 52,346 | 3,470 | 65,537 | 4,473 | 881 |
| Western Nova Scotia | 19 | 36 | 319 | 47,125 | 38,307 | 1,620 | 79,893 | 9,920 | 29,572 | 3,040 | 6,248 | 5,975 | 111 |
| Central Maine | 3 | 4 | 18 | 745 | 540 | | 565 | 35 | 7,550 | 6,630 | 780 | | |
| Western Maine | 14 | 73 | 260 | 32,950 | 24,525 | | 60,050 | 6,825 | 35,990 | 79,200 | 6,060 | 310 | 508 |
| Eastern Massachusetts | 39 | 215 | 798 | 61,198 | 92,935 | 15,720 | 34,970 | 69,900 | 196,955 | 110,865 | 2,584,300 | 7,200 | 173 |
| Inner Grounds | 43 | 152 | 701 | 39,701 | 42,807 | 5,405 | 93,635 | 15,160 | 76,795 | 14,120 | 174,548 | 37,632 | 32 |
| Western Side South Channel | 64 | 417 | 2,609 | 394,421 | 441,899 | 4,960 | 2,732,042 | 1,343,837 | 293,263 | 38,655 | 197,877 | 18,311 | 2,404 |
| Eastern Side South Channel | 35 | 148 | 968 | 277,334 | 276,741 | 14,500 | 2,142,143 | 655,380 | 143,330 | | 103,256 | 11,402 | 5,682 |
| Northern Edge of Georges | 24 | 56 | 336 | 122,259 | 321,640 | 1,250 | 898,775 | 568,220 | 23,055 | | 32,311 | 290 | 3,554 |
| Northeast Peak of Georges | 12 | 44 | 303 | 460,212 | 338,215 | 850 | 707,615 | 439,045 | 9,109 | | 64,673 | 315 | 2,023 |
| Central Georges | 20 | 85 | 599 | 194,822 | 268,350 | 5,400 | 1,452,850 | 679,563 | 10,442 | | 78,592 | 350 | 5,518 |
| Southeast Georges | 11 | 27 | 188 | 391,763 | 149,420 | 450 | 384,230 | 193,400 | 4,675 | | 42,075 | | 1,821 |
| Southwest Georges | 11 | 26 | 185 | 12,375 | 78,950 | 450 | 591,720 | 207,020 | 5,915 | | 4,732 | | 4,898 |
| Lightship Grounds | 10 | 13 | 91 | 7,880 | 36,010 | | 363,845 | 60,860 | 4,540 | 655 | 3,650 | | |
| Nantucket Shoals | 4 | 5 | 28 | 400 | 1,000 | 100 | 400 | | 315 | 1,025 | | | |
| Off No Mans Land | 6 | 8 | 35 | 460 | 810 | | 150 | | 5,630 | | 300 | | |
| Southern New England, unclassified | 11 | 17 | 88 | 27,780 | 28,835 | 100 | 130,230 | 57,840 | 8,070 | | 16,060 | 200 | 795 |
| Total | [1] 86 | 1,531 | 9,115 | 2,447,290 | 2,431,312 | 60,255 | 10,314,640 | 4,494,805 | 975,100 | 264,165 | 3,415,443 | 90,423 | 28,553 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Otter trawls, small: | | | | | | | | | | | | | |
| Western Nova Scotia | 1 | 2 | 18 | 325 | 515 | | 480 | 200 | 355 | 75 | 70 | 50 | 195 |
| Eastern Maine | 1 | 1 | 5 | | | | | | | | | | |
| Central Maine | 18 | 150 | 1,060 | 68,486 | 41,819 | 985 | 213,725 | 6,215 | 241,411 | 109,970 | 4,155 | 110 | 270 |
| Western Maine | 48 | 203 | 671 | 52,167 | 40,676 | 8,775 | 98,822 | 2,200 | 100,054 | 197,790 | 6,165 | 2,560 | 192 |
| Eastern Massachusetts | 76 | 1,454 | 4,422 | 347,420 | 459,919 | 76,115 | 214,533 | 52,947 | 136,059 | 628,045 | 788,658 | 6,005 | 322 |
| Inner Grounds | 38 | 100 | 367 | 22,935 | 29,035 | 2,995 | 34,145 | 4,635 | 22,150 | 20,095 | 28,935 | 615 | 17 |
| Western Side South Channel | 40 | 95 | 353 | 52,455 | 50,945 | 26,635 | 104,455 | 14,295 | 20,655 | 23,470 | 5,095 | 1,060 | 10 |
| Eastern Side South Channel | 3 | 8 | 39 | 3,205 | 5,150 | | 52,744 | 19,560 | 4,170 | 300 | 350 | 45 | |
| Central Georges | 1 | 1 | 8 | | 1,800 | | 2,646 | 4,140 | 180 | | | | |
| Lightship Grounds | 6 | 6 | 34 | 1,275 | 9,025 | | 57,200 | 3,050 | 2,440 | | 545 | | |
| Nantucket Shoals | 11 | 26 | 93 | 1,280 | 3,695 | | 1,590 | | 12,145 | 1,000 | 200 | | 13 |
| Off No Mans Land | 9 | 17 | 58 | 100 | 970 | | | | 3,200 | | 75 | | |
| Southern Massachusetts | 3 | 6 | 20 | | | | | | 3,300 | | | | |
| Total | [1] 98 | 2,069 | 7,148 | 549,648 | 643,549 | 115,505 | 780,310 | 107,242 | 546,119 | 980,745 | 834,248 | 10,445 | 1,019 |
| Sink gill nets: | | | | | | | | | | | | | |
| Western Maine | 18 | 2,212 | 2,212 | 1,562,599 | 480,275 | 6,244 | 291,802 | 1,220 | 757,295 | 73,030 | 1,938,061 | 9,716 | 241 |
| Eastern Massachusetts | 37 | 3,842 | 3,842 | 1,370,806 | 952,840 | 9,780 | 456,898 | 1,920 | 948,384 | 4,467 | 8,850,953 | 4,160 | 588 |
| Total | [1] 48 | 6,054 | 6,054 | 2,933,405 | 1,433,115 | 16,024 | 748,700 | 3,140 | 1,705,679 | 77,497 | 10,789,014 | 13,876 | 829 |
| Drift gill nets: | | | | | | | | | | | | | |
| Western Maine | 2 | 18 | 18 | 265 | 595 | | | | | | 20 | 400 | |
| Eastern Massachusetts | 33 | 222 | 262 | | | | | | | | 7,145 | | |
| Inner Grounds | 5 | 6 | 16 | | | | | | | | | | |
| Western Side South Channel | 9 | 21 | 68 | | | | | | | | | | |
| Southern Massachusetts | 1 | 1 | 3 | | | | | | | | | | |
| Total | [1] 35 | 268 | 367 | [2] 265 | [2] 595 | | | | | | [2] 7,165 | [2] 400 | |
| Purse seines: | | | | | | | | | | | | | |
| Magdalen Islands | 1 | 1 | 16 | | | | | | | | | | |
| Northeast Cape Breton | 1 | 1 | 72 | | | | | | | | | | |
| Canso | 2 | 2 | 19 | | | | | | | | | | |
| Eastern Nova Scotia | 4 | 5 | 34 | | | | | | | | | | |
| Central Nova Scotia | 4 | 5 | 51 | | | | | | | | | | |
| Browns Bank | 1 | 1 | 4 | | | | | | | | | | |
| Central Maine | 21 | 53 | 256 | 350 | 105 | 65 | | | | | 48,430 | | |
| Western Maine | 8 | 9 | 28 | | | | | | | | | | |
| Eastern Massachusetts | 61 | 424 | 1,222 | | 45 | 25 | | | 80 | | 5,090 | | |
| Inner Grounds | 1 | 1 | 5 | | 100 | | | | | | | | |
| Western Side South Channel | 23 | 36 | 123 | | | | | | | | | | |
| Lightship Grounds | 15 | 17 | 67 | | | | | | | | | | |
| Nantucket Shoals | 2 | 2 | 6 | | | | | | | | | | |
| Off No Mans Land | 46 | 91 | 369 | | | | | | | | | | |

See footnotes at end of table.

*Landings by fishing vessels at the three principal New England ports, 1937*—Continued

BY GEAR AND FISHING AREAS—Continued

| Gear and fishing areas | Vessels fishing | Trips | Days absent | Cod | | | Haddock | | Hake | | Pollock | Cusk | Halibut |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Large | Market | Scrod | Large | Scrod | Large | Small | | | |
| Purse seines—Continued | *Number* | *Number* | *Number* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Southern Massachusetts | 1 | 1 | 2 | | | | | | | | | | |
| Rhode Island | 7 | 8 | 23 | | | | | | | | | | |
| South | 24 | 34 | 125 | | | | | | | | | | |
| Total | [1] 76 | 691 | 2,422 | [2] 350 | [2] 250 | [2] 90 | | | [2] 80 | | [2] 53,520 | | |
| Scallop drags: | | | | | | | | | | | | | |
| Northern Edge of Georges | 1 | 1 | 9 | | | | | | | | | | |
| Southwest Georges | 1 | 1 | 5 | | | | | | | | | | |
| Total | 2 | 2 | 14 | | | | | | | | | | |
| Grand total | [1] 373 | 15,431 | 56,057 | 37,539,038 | 61,640,848 | 3,207,537 | 102,909,169 | 34,266,100 | 12,255,169 | 1,948,442 | 28,674,406 | 8,027,037 | 2,010,363 |

[1] Exclusive of duplication.

[2] Incidental catch.

NOTE.—The 3 principal New England ports are Boston and Gloucester, Mass., and Portland, Maine. Otter trawls are classified according to the size of the vessel. The weight of salted fish landed has been converted to the equivalent of fresh fish as landed. Only landings by vessels having a capacity of 5 net tons or greater are used in this tabulation. "Occasional" after the name of a bank or ground indicates that the vessel or vessels contributing to the catch as shown fished chiefly with another type of gear. In such cases the number of vessels fishing, number of trips, and number of days absent, are shown under the principal type of gear used. The statistics of landings shown in this bulletin do not correspond exactly with the total of the 12 monthly bulletins since some of the monthly figures have been revised.

*Landings by fishing vessels at the three principal New England ports, 1937*—Continued

BY GEAR AND FISHING AREAS—Continued

| Gear and fishing areas | Mackerel | Flounders |  |  |  |  |  | Swordfish | Whiting | Wolffish | Rosefish | Herring | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Gray sole | Lemon sole | Yellowtail | Blackback | Dab | Other |  |  |  |  |  |  |  |
| Line trawls: | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Treaty Coast |  |  |  |  |  |  |  |  |  |  |  |  |  | 516, 660 |
| Magdalen Islands |  |  |  |  |  |  |  |  |  |  |  |  |  | 1, 369, 200 |
| Magdalen Islands (occasional) |  |  |  |  |  |  |  |  |  |  |  |  |  | 95, 000 |
| Gulf of St. Lawrence, unclassified |  |  |  |  |  |  |  |  |  |  |  |  |  | 336, 741 |
| Grand Bank |  |  |  |  |  |  |  | 300 |  |  |  |  |  | 416, 330 |
| Green Bank |  |  |  |  |  |  |  |  |  |  |  |  |  | 109, 008 |
| St. Pierre Bank |  |  |  |  |  |  |  |  |  |  |  |  |  | 213, 153 |
| Northeast Cape Breton |  |  |  |  |  |  |  |  |  |  |  |  |  | 134, 681 |
| Banquereau |  |  |  |  |  |  |  | 514 |  |  |  |  |  | 499, 365 |
| Middle Ground |  |  |  |  |  |  |  |  |  |  |  |  |  | 106, 841 |
| Northeast Sable Island Bank |  |  |  |  |  |  |  |  |  | 75 |  |  |  | 109, 771 |
| Southeast Sable Island Bank |  |  |  |  |  |  |  |  |  | 460 |  |  |  | 38, 001 |
| Horseshoe Ground |  | 52, 700 |  |  |  |  |  |  |  | 425 |  |  |  | 175, 209 |
| Southwest Sable Island Bank |  |  |  |  |  |  |  |  |  | 1, 675 |  |  |  | 227, 029 |
| Eastern Nova Scotia |  |  |  |  |  |  |  |  |  |  |  |  |  | 144, 733 |
| Emerald Bank |  |  |  |  |  |  |  | 312 |  | 5, 870 |  |  |  | 869, 026 |
| Central Nova Scotia |  |  |  |  |  |  |  |  |  | 100 |  |  |  | 79, 022 |
| La Have Bank (including Sambro Bank) |  |  |  |  |  |  |  | 1, 221 |  | 15, 425 | 200 |  |  | 2, 395, 320 |
| Southern Nova Scotia |  | 840 |  |  |  | 2, 675 |  |  |  | 44, 726 |  |  |  | 2, 411, 405 |
| Browns Bank |  |  | 2, 100 |  |  | 1, 810 |  | 2, 200 |  | 86, 217 | 150 |  | 15 | 9, 495, 611 |
| Western Nova Scotia |  |  |  |  |  |  |  |  |  | 28, 355 |  |  |  | 2, 505, 301 |
| Southern Bay of Fundy |  |  |  |  |  |  |  |  |  |  |  |  |  | 120, 950 |
| Nova Scotia, unclassified |  |  |  |  |  |  |  |  |  | 6, 085 |  |  |  | 654, 406 |
| Eastern Maine |  |  |  |  |  |  |  |  |  |  |  |  |  | 66, 255 |
| Central Maine |  | 7, 300 | 20 |  |  | 100 |  |  |  | 1, 335 | 325 |  | 208 | 2, 621, 364 |
| Western Maine |  | 15 |  |  | 110 | 335 |  |  | 7, 200 | 535 | 650 |  | 20 | 314, 202 |
| Eastern Massachusetts |  | 425 |  | 20, 900 | 3, 600 | 4, 115 |  |  | 6, 400 | 22, 450 | 435 |  | 1, 435 | 1, 846, 913 |
| Eastern Massachusetts (occasional) |  |  |  |  |  |  |  |  |  |  |  |  |  | 3, 250 |
| Inner Grounds |  | 700 |  | 5, 000 |  | 495 |  |  | 500 | 8, 465 | 230 |  | 48 | 9, 172, 271 |
| Western Side South Channel |  | 1, 225 |  |  | 150 | 150 | 650 | 437 | 1, 300 | 1, 800 | 64, 210 |  | 825 | 3, 215, 993 |
| Eastern Side South Channel |  |  |  | 4, 300 |  | 1, 900 |  |  |  | 8, 090 |  |  |  | 2, 164, 018 |
| Northern Edge of Georges |  |  |  |  |  | 140 |  |  |  | 670 |  |  |  | 836, 806 |
| Northeast Peak of Georges |  |  |  |  |  |  |  |  |  | 125 |  |  |  | 290, 422 |
| Lightship Grounds |  |  |  |  |  |  |  |  |  |  |  |  |  | 114, 960 |
| Nantucket Shoals |  |  |  |  |  |  |  |  |  | 100 |  |  |  | 50, 272 |
| Off No Mans Land |  |  |  | 14, 400 |  |  |  |  | 1, 800 | 1, 300 |  |  |  | 100, 533 |
| Southern New England, unclassified |  |  |  |  |  |  |  |  |  | 110 |  |  |  | 186, 581 |
| Total |  | 63, 205 | 2, 120 | 44, 600 | 3, 860 | 11, 720 | 650 | [2] 4, 984 | 17, 200 | 234, 393 | 66, 200 |  | 2, 551 | 44, 006, 603 |

[2] Incidental catch.

*Landings by fishing vessels at the three principal New England ports, 1937*—Continued

BY GEAR AND FISHING AREAS—Continued

| Gear and fishing areas | Mackerel | Flounders | | | | | | Swordfish | Whiting | Wolffish | Rosefish | Herring | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Gray sole | Lemon sole | Yellowtail | Blackback | Dab | Other | | | | | | | |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Hand lines: | | | | | | | | | | | | | | |
| Central Maine (occasional) | | | | | | | | | | | | | | 1, 435 |
| Western Maine | | | | | | | | | | | | | | 1, 335 |
| Eastern Massachusetts | | | | | | | | | | | | | | 8, 694 |
| Eastern Massachusetts (occasional) | | | | | | | | | | | | | | 690 |
| Western Side South Channel | | | | | | | | | | | | | | 13, 600 |
| Total | | | | | | | | | | | | | | 25, 754 |
| Harpoons: | | | | | | | | | | | | | | |
| Grand Bank (occasional) | | | | | | | | 3, 264 | | | | | | 3, 264 |
| Green Bank (occasional) | | | | | | | | 567 | | | | | | 567 |
| Northeast Cape Breton | | | | | | | | 103, 349 | | | | | 397 | 103, 746 |
| Banquereau | | | | | | | | 20, 312 | | | | | | 20, 315 |
| Northeast Sable Island Bank | | | | | | | | 4, 765 | | | | | | 4, 762 |
| Horseshoe Ground | | | | | | | | 1, 301 | | | | | | 1, 301 |
| La Have Bank (including Sambro Bank) | | | | | | | | 4, 140 | | | | | | 4, 140 |
| La Have Bank (including Sambro Bank) (occasional) | | | | | | | | 918 | | | | | | 918 |
| Southern Nova Scotia (occasional) | | | | | | | | 4, 983 | | | | | | 4, 983 |
| Browns Bank | | | | | | | | 363, 109 | | | | | | 363, 109 |
| Browns Bank (occasional) | | | | | | | | 8, 585 | | | | | | 8, 585 |
| Western Nova Scotia (occasional) | | | | | | | | 2, 971 | | | | | | 2, 971 |
| Nova Scotia, unclassified | | | | | | | | 6, 946 | | | | | | 6, 946 |
| Western Maine | | | | | | | | | | | | | 4, 424 | 4, 424 |
| Eastern Massachusetts | | | | | | | | 185 | | | | | | 185 |
| Eastern Massachusetts (occasional) | | | | | | | | | | | | | 65 | 65 |
| Western Side South Channel | | | | | | | | 5, 499 | | | | | | 5, 499 |
| Eastern Side South Channel | | | | | | | | 2, 657 | | | | | | 2, 657 |
| Northern Edge of Georges | | | | | | | | 54, 164 | | | | | | 54, 164 |
| Northern Edge of Georges (occasional) | | | | | | | | 540 | | | | | | 540 |
| Northeast Peak of Georges | | | | | | | | 83, 403 | | | | | | 83, 403 |
| Southeast Georges | | | | | | | | 79, 499 | | | | | | 79, 499 |
| Southwest Georges | | | | | | | | 199, 218 | | | | | | 199, 218 |
| Lightship Grounds | | | | | | | | 75, 808 | | | | | | 75, 808 |
| Nantucket Shoals (occasional) | | | | | | | | 502 | | | | | | 502 |
| Off No Mans Land | | | | | | | | 10, 397 | | | | | | 10, 397 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Southern New England, unclassified | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 47,512 | ---- | ---- | ---- | ---- | ---- | 47,512 |
| South | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 34,163 | ---- | ---- | ---- | ---- | ---- | 34,163 |
| Total | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1,118,757 | ---- | ---- | ---- | ---- | 4,886 | 1,123,643 |
| Otter trawls, large: | | | | | | | | | | | | | | |
| Newfoundland Banks, unclassified | ---- | ---- | 20 | 2,400 | ---- | 500 | ---- | ---- | ---- | 100 | 20 | ---- | ---- | 420,547 |
| Misaine Bank | ---- | 3,000 | 5,000 | ---- | ---- | 4,250 | ---- | ---- | ---- | 100 | ---- | ---- | ---- | 126,001 |
| Banquereau | ---- | 80,909 | 5,367 | 298,545 | 587 | 182,812 | 87,530 | ---- | ---- | 83,524 | 72,640 | ---- | 2,229 | 21,713,693 |
| Middle Ground | 138 | 419,903 | 2,997 | 346,713 | ---- | 47,872 | 42,340 | ---- | 2,200 | 58,415 | 15,303 | ---- | 2,170 | 7,632,454 |
| Northeast Sable Island Bank | 137 | 32,445 | 12,868 | 69,895 | 240 | 44,941 | 31,745 | ---- | ---- | 79,651 | 167,710 | ---- | 307 | 7,890,121 |
| Southeast Sable Island Bank | ---- | 36,670 | 6,350 | 700 | ---- | 13,517 | 33,665 | ---- | ---- | 22,795 | ---- | ---- | ---- | 1,927,263 |
| Horseshoe Ground | ---- | 1,475,346 | 28,488 | 159,765 | 228 | 32,136 | 118,873 | ---- | 1,500 | 161,157 | 84,089 | ---- | 827 | 19,386,397 |
| Southwest Sable Island Bank | ---- | 88,954 | 13,394 | 24,776 | 340 | 21,477 | 14,793 | ---- | ---- | 153,672 | 53,184 | ---- | 188 | 7,760,880 |
| Eastern Nova Scotia | ---- | 62,490 | 180 | ---- | ---- | 395 | 700 | ---- | ---- | 1,530 | 6,488 | ---- | 22 | 246,991 |
| Emerald Bank | ---- | 458,620 | 7,893 | 27,649 | 10 | 48,411 | 46,548 | ---- | ---- | 188,956 | 18,525 | ---- | 656 | 10,214,235 |
| Central Nova Scotia | ---- | 450 | 270 | 2,280 | ---- | 1,400 | ---- | ---- | ---- | 240 | ---- | ---- | ---- | 79,598 |
| La Have Bank (including Sambro Bank) | ---- | 4,268 | 855 | 1,800 | 50 | 1,335 | ---- | ---- | ---- | 1,515 | 62,307 | ---- | ---- | 282,438 |
| Southern Nova Scotia | ---- | 256,240 | 10,970 | 2,875 | 350 | 34,214 | 14,810 | ---- | 280 | 4,067 | 6,191,276 | ---- | 103 | 7,591,491 |
| Browns Bank | 116 | 301,561 | 44,698 | 55,143 | 2,690 | 78,395 | 32,351 | ---- | 1,990 | 216,079 | 6,644,155 | ---- | 3,720 | 21,481,840 |
| Western Nova Scotia | ---- | 4,950 | ---- | 27,205 | 995 | 1,760 | ---- | ---- | ---- | 445 | 6,100 | ---- | ---- | 1,349,019 |
| Nova Scotia, unclassified | ---- | 107,630 | 3,140 | 78,500 | ---- | 3,590 | 20,130 | ---- | ---- | 20,755 | 263,081 | ---- | ---- | 3,098,102 |
| Eastern Massachusetts | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 11,830 |
| Inner Grounds | ---- | 860 | ---- | 240 | ---- | ---- | ---- | ---- | 28,180 | 80 | 200,399 | ---- | ---- | 242,967 |
| Western Side South Channel | 202 | 165,404 | 116,365 | 28,182 | 101,934 | 37,855 | 8,430 | ---- | 44,470 | 36,911 | 7,363,613 | ---- | 4,812 | 16,202,685 |
| Eastern Side South Channel | 350 | 250,529 | 114,100 | 40,522 | 43,523 | 250,491 | 44,520 | ---- | 10,366 | 51,378 | 4,398,756 | ---- | 3,022 | 13,068,058 |
| Northern Edge of Georges | 8,141 | 101,926 | 429,524 | 112,976 | 48,687 | 81,572 | 38,744 | ---- | 31,311 | 178,801 | 202,421 | ---- | 10,533 | 33,537,561 |
| Northeast Peak of Georges | 28,082 | 59,286 | 398,449 | 89,992 | 26,325 | 37,467 | 47,864 | ---- | 3,560 | 245,364 | 236,499 | ---- | 21,971 | 51,561,572 |
| Central Georges | 175 | 21,603 | 222,297 | 63,376 | 25,765 | 10,270 | 22,752 | ---- | 4,048 | 17,596 | 4,720 | ---- | 658 | 4,434,024 |
| Southeast Georges | 4,735 | 13,920 | 28,251 | 28,725 | 480 | 13,520 | 9,215 | ---- | ---- | 14,313 | 720 | ---- | 12,871 | 6,169,020 |
| Southwest Georges | ---- | 55 | 12,729 | 3,511 | 2,972 | 380 | 460 | ---- | ---- | 535 | 4,320 | ---- | 10 | 214,750 |
| Lightship Grounds | ---- | ---- | 4,800 | 540 | ---- | ---- | 280 | ---- | ---- | 60 | 11,100 | ---- | ---- | 64,424 |
| Nantucket Shoals | ---- | ---- | 7,835 | 1,275 | 11,364 | ---- | ---- | ---- | ---- | 1,800 | ---- | ---- | ---- | 409,644 |
| Southern New England, unclassified | ---- | 19,835 | 22,695 | 10,595 | 8,580 | 1,450 | 1,975 | ---- | ---- | 6,259 | 175,947 | ---- | 50 | 1,655,812 |
| Total | [2] 42,076 | 3,966,854 | 1,499,535 | 1,478,180 | 275,120 | 950,010 | 617,725 | ---- | 127,905 | 1,546,098 | 26,183,373 | ---- | 64,149 | 238,773,420 |
| Otter trawls, medium: | | | | | | | | | | | | | | |
| Southeast Sable Island Bank | ---- | 2,625 | ---- | ---- | ---- | 1,000 | 200 | ---- | ---- | ---- | 28,395 | ---- | ---- | 38,235 |
| Southern Nova Scotia | ---- | 187,127 | 2,250 | 1,470 | 50 | 49,505 | 6,487 | ---- | ---- | 13,425 | 5,814,689 | ---- | 895 | 6,601,176 |
| Browns Bank | 22 | 125,226 | 2,680 | 1,270 | 1,010 | 71,157 | 378 | ---- | 500 | 14,962 | 4,878,599 | ---- | 150 | 6,308,953 |
| Western Nova Scotia | ---- | 59,307 | 665 | 500 | 75 | 13,177 | 290 | ---- | ---- | 2,113 | 1,941,105 | ---- | ---- | 2,239,043 |
| Central Maine | ---- | 17,375 | ---- | 4,250 | 800 | 2,725 | 800 | ---- | ---- | 110 | 9,635 | ---- | ---- | 52,540 |
| Western Maine | ---- | 357,350 | 2,190 | 11,305 | 2,700 | 66,115 | 8,000 | ---- | 78,150 | 2,740 | 360,731 | ---- | 1,830 | 1,137,529 |
| Eastern Massachusetts | 600 | 180,385 | 1,150 | 96,912 | 23,285 | 74,350 | 2,895 | ---- | 451,400 | 5,910 | 304,925 | ---- | 11,267 | 4,327,295 |
| Inner Grounds | ---- | 241,463 | 1,195 | 9,235 | 3,435 | 43,237 | ---- | ---- | 15,898 | 1,958 | 2,379,649 | ---- | 5,000 | 3,200,905 |
| Western Side South Channel | 745 | 287,467 | 83,240 | 22,598 | 93,360 | 101,713 | 5,073 | ---- | 119,742 | 17,266 | 12,944,548 | ---- | 23,555 | 19,166,976 |

[2] Incidental catch.

*Landings by fishing vessels at the three principal New England ports, 1937*—Continued

BY GEAR AND FISHING AREAS—Continued

| Gear and fishing areas | Mackerel | Flounders | | | | | | Swordfish | Whiting | Wolffish | Rosefish | Herring | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Gray sole | Lemon sole | Yellowtail | Blackback | Dab | Other | | | | | | | |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Otter trawls, medium—Continued | | | | | | | | | | | | | | |
| Eastern Side South Channel | 100 | 89,445 | 157,510 | 32,450 | 33,210 | 164,447 | 30,040 | ------ | 27,752 | 35,091 | 2,041,684 | ------ | 2,325 | 6,243,822 |
| Northern Edge of Georges | ------ | 3,455 | 69,248 | 14,460 | 19,805 | 37,714 | 2,390 | 540 | 7,525 | 9,240 | 34,420 | ------ | 523 | 2,170,674 |
| Northeast Peak of Georges | 73 | 3,690 | 54,580 | 24,052 | 13,875 | 4,668 | 810 | ------ | 25 | 6,000 | 4,500 | ------ | 600 | 2,134,930 |
| Central Georges | ------ | 4,955 | 312,949 | 102,240 | 75,700 | 6,493 | 5,902 | ------ | 463 | 5,415 | ------ | ------ | 275 | 3,210,279 |
| Southeast Georges | ------ | 4,890 | 29,972 | 13,943 | 6,585 | 1,607 | 470 | ------ | ------ | 2,600 | ------ | ------ | ------ | 1,227,901 |
| Southwest Georges | ------ | 1,235 | 168,647 | 11,410 | 38,300 | 1,800 | 9,565 | ------ | ------ | 1,545 | 2,200 | ------ | 140 | 1,140,902 |
| Lightship Grounds | 585 | 4,308 | 1,850 | 2,550 | 3,900 | 5,360 | 460 | ------ | ------ | 485 | 182,876 | ------ | 60 | 679,874 |
| Nantucket Shoals | ------ | 4,000 | ------ | 71,970 | 925 | 500 | 7,550 | ------ | ------ | ------ | 6,500 | ------ | 9,690 | 104,375 |
| Off No Mans Land | ------ | 6,945 | ------ | 123,100 | ------ | 620 | 1,845 | ------ | 6,500 | ------ | 49,950 | ------ | 13,410 | 209,720 |
| Southern New England, unclassified | ------ | 5,460 | 21,008 | 7,165 | 1,760 | 5,465 | ------ | ------ | 1,200 | 1,285 | 32,170 | ------ | 450 | 345,873 |
| Total | [2] 2,125 | 1,586,708 | 909,134 | 550,880 | 318,775 | 651,653 | 83,155 | [2] 540 | 709,155 | 120,145 | 31,016,576 | ------ | 70,170 | 60,541,002 |
| Otter trawls, small: | | | | | | | | | | | | | | |
| Western Nova Scotia | ------ | 260 | ------ | ------ | ------ | 1,560 | ------ | ------ | ------ | 170 | 14,300 | ------ | ------ | 18,555 |
| Eastern Maine | ------ | 8,000 | ------ | ------ | ------ | 500 | 900 | ------ | ------ | ------ | ------ | 1,000 | ------ | 10,400 |
| Central Maine | ------ | 390,680 | 1,165 | 27,680 | 29,432 | 115,255 | 4,765 | ------ | 3,000 | 13,515 | 103,640 | ------ | 308 | 1,376,586 |
| Western Maine | ------ | 583,515 | 25,275 | 74,000 | 40,435 | 129,110 | 10,954 | 139 | 236,609 | 9,427 | 413,440 | ------ | 11,072 | 2,043,377 |
| Eastern Massachusetts | 600 | 1,001,690 | 6,825 | 980,175 | 392,905 | 603,710 | 2,950 | ------ | 5,191,981 | 57,405 | 266,138 | 400 | 59,063 | 11,273,865 |
| Inner Grounds | ------ | 137,585 | ------ | 34,870 | 13,265 | 55,025 | 65 | ------ | 50,237 | 2,610 | 93,815 | ------ | 2,440 | 555,469 |
| Western Side South Channel | ------ | 99,808 | 11,737 | 67,820 | 20,755 | 40,310 | 2,100 | ------ | 184,648 | 18,500 | 159,060 | ------ | 3,410 | 907,223 |
| Eastern Side South Channel | ------ | 2,803 | 60 | 3,283 | 140 | 3,335 | ------ | ------ | 5,126 | 478 | 700 | ------ | 295 | 101,744 |
| Central Georges | ------ | 297 | 540 | 207 | 225 | ------ | ------ | ------ | ------ | 27 | ------ | ------ | ------ | 10,062 |
| Lightship Grounds | ------ | ------ | 2,830 | 75,815 | 1,965 | ------ | 135 | ------ | ------ | 230 | ------ | ------ | 150 | 154,660 |
| Nantucket Shoals | 165 | 2,277 | 6,703 | 393,300 | 4,810 | ------ | 815 | ------ | 600 | 320 | ------ | ------ | 1,865 | 430,778 |
| Off No Mans Land | ------ | 575 | ------ | 322,390 | 140 | ------ | 1,930 | ------ | 9,000 | ------ | ------ | ------ | 3,925 | 342,305 |
| Southern Massachusetts | ------ | ------ | ------ | 89,100 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 60 | 92,460 |
| Total | [2] 765 | 2,227,490 | 55,135 | 2,068,640 | 504,072 | 948,805 | 24,614 | [2] 139 | 5,681,201 | 102,682 | 1,051,093 | [2] 1,400 | 82,588 | 17,317,484 |
| Sink gill nets: | | | | | | | | | | | | | | |
| Western Maine | 307 | 1,353 | ------ | 65 | 2,497 | 2,326 | 65 | ------ | 85 | 1,322 | 9,257 | ------ | 29,644 | 5,167,404 |
| Eastern Massachusetts | 249 | 175 | ------ | 1,320 | 2,075 | 7,755 | 570 | ------ | ------ | 760 | 720 | 4,875 | 71,143 | 12,690,438 |
| Total | [2] 556 | 1,528 | ------ | 1,385 | 4,572 | 10,081 | 635 | ------ | 85 | 2,082 | 9,977 | [2] 4,875 | 100,787 | 17,857,842 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Drift gill nets: | | | | | | | | | | | | | | |
| Magdalen Islands (occasional) | 176, 580 | | | | | | | | | | | | | 176, 580 |
| Western Maine | 16, 006 | | | | | | | | | | | 37 | 227 | 17, 550 |
| Eastern Massachusetts | 771, 193 | | | | | | | | 3, 256 | | | | 5, 958 | 787, 552 |
| Inner Grounds | 86, 300 | | | | | | | | | | | | 340 | 86, 640 |
| Western Side South Channel | 274, 350 | | | | | | | | | | | | 2, 196 | 276, 546 |
| Southern Massachusetts | 6, 275 | | | | | | | | | | | | 225 | 6, 500 |
| Total | 1, 330, 704 | | | | | | | | [2] 3, 256 | | | [2] 37 | 8, 946 | 1, 351, 368 |
| Purse seines: | | | | | | | | | | | | | | |
| Magdalen Islands | 161, 730 | | | | | | | | | | | | | 161, 730 |
| Northeast Cape Breton | 770 | | | | | | | | | | | | | 770 |
| Canso | 90, 375 | | | | | | | | | | | | | 90, 375 |
| Eastern Nova Scotia | 196, 470 | | | | | | | | | | | | | 196, 470 |
| Central Nova Scotia | 166, 395 | | | | | | | | | | | | | 166, 395 |
| Browns Bank | 36, 775 | | | | | | | | | | | | | 36, 775 |
| Central Maine | 371, 702 | | | | | | | | | | | 200 | 10, 670 | 431, 522 |
| Western Maine | 90, 450 | | | | | | | | | | | | 2, 000 | 92, 450 |
| Eastern Massachusetts | 2, 226, 648 | | | | 25 | | | | | | | | 220, 903 | 2, 452, 816 |
| Eastern Massachusetts (occasional) | 3, 355 | | | | | | | | | | | | 400 | 3, 755 |
| Inner Grounds | 140 | | | | | | | | | | | | | 240 |
| Western Side South Channel | 382, 690 | | | | | | | | | | | | 4, 610 | 387, 300 |
| Lightship Grounds | 390, 300 | | | | | | | | | | | | 165 | 390, 465 |
| Nantucket Shoals | 63, 000 | | | | | | | | | | | | | 63, 000 |
| Nantucket Shoals (occasional) | 910 | | | | | | | | | | | | | 910 |
| Off No Mans Land | 2, 310, 710 | | | | | | | | | | | | 1, 200 | 2, 311, 910 |
| Southern Massachusetts | 27, 800 | | | | | | | | | | | | | 27, 800 |
| Rhode Island | 282, 140 | | | | | | | | | | | | | 282, 140 |
| South | 1, 124, 035 | | | | | | | | | | | | 1, 710 | 1, 125, 745 |
| Total | 7, 926, 395 | | | | [2] 25 | | | | | | | [2] 200 | 241, 658 | 8, 222, 568 |
| Scallop drags: | | | | | | | | | | | | | | |
| Northern Edge of Georges | | | | | | | | | | | | | 4, 059 | 4, 059 |
| Southwest Georges | | | | | | | | | | | | | 4, 500 | 4, 500 |
| Total | | | | | | | | | | | | | 8, 559 | 8, 559 |
| Grand total | 9, 302, 621 | 7, 845, 785 | 2, 465, 924 | 4, 143, 685 | 1, 106, 424 | 2, 572, 269 | 726, 779 | 1, 124, 420 | 6, 538, 802 | 2, 005, 400 | 58, 327, 219 | 6, 512 | 584, 294 | 389, 228, 243 |

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[2] Incidental catch.

*Landings by fishing vessels at the three principal New England ports, 1937*—Continued

SUMMARY: BY FISHING AREAS

| Fishing areas | Vessels fishing | Trips | Days absent | Cod | | | Haddock | | Hake | | Pollock | Cusk | Halibut |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Large | Market | Scrod | Large | Scrod | Large | Small | | | |
| Gulf of St. Lawrence (Area XIX): | *Number* | *Number* | *Number* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Treaty Coast | 2 | 2 | 207 | 138, 934 | 314, 767 | 56, 683 | ---------- | ---------- | 3, 749 | ---------- | 2, 527 | ---------- | ---------- |
| Magdalen Islands | 1 | 4 | 152 | 1, 221, 700 | 242, 500 | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- |
| Gulf of St. Lawrence, unclassified | 5 | 7 | 140 | 39, 779 | 25, 751 | ---------- | 6, 700 | ---------- | 149, 075 | ---------- | ---------- | 11, 255 | 104, 181 |
| Newfoundland Banks (Area XX): | | | | | | | | | | | | | |
| Grand Bank | 2 | 6 | 158 | 98, 496 | 11, 650 | ---------- | ---------- | ---------- | 7, 564 | ---------- | ---------- | ---------- | 298, 320 |
| Green Bank | 1 | 2 | 48 | 5, 113 | 233 | ---------- | ---------- | ---------- | 3, 470 | ---------- | ---------- | 2, 496 | 97, 696 |
| St. Pierre Bank | 2 | 4 | 86 | 2,726 | 1,900 | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 208, 527 |
| Newfoundland Banks, unclassified | 3 | 4 | 32 | 62, 600 | 103, 700 | 9, 400 | 220, 300 | 18, 080 | 760 | ---------- | 2, 560 | 20 | 87 |
| Total | [1] 12 | 29 | 823 | 1, 569, 348 | 700, 501 | 66, 083 | 227, 000 | 18, 080 | 164, 618 | ---------- | 5, 087 | 13, 771 | 708, 811 |
| Off Nova Scotia (Area XXI): | | | | | | | | | | | | | |
| Northeast Cape Breton | 18 | 20 | 415 | 7, 521 | 3, 776 | ---------- | 20, 255 | 165 | 11, 200 | ---------- | 855 | 35, 300 | 55, 609 |
| Misaine Bank | 1 | 1 | 12 | 6, 500 | 22, 500 | 2, 700 | 81, 000 | 500 | 100 | ---------- | 100 | ---------- | 251 |
| Banquereau | 53 | 151 | 1, 698 | 2, 998, 907 | 12, 114, 964 | 1, 017, 816 | 3, 881, 991 | 774, 350 | 106, 077 | ---------- | 200, 030 | 15, 226 | 289, 040 |
| Canso | 2 | 2 | 19 | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- |
| Middle Ground | 38 | 77 | 635 | 977, 575 | 2, 236, 341 | 176, 815 | 3, 000, 470 | 166, 605 | 68, 535 | ---------- | 152, 715 | 8, 335 | 13, 853 |
| Northeast Sable Island Bank | 41 | 84 | 649 | 1, 177, 898 | 2, 656, 991 | 82, 535 | 2, 998, 095 | 296, 515 | 44, 560 | ---------- | 227, 327 | 30, 623 | 45, 334 |
| Southeast Sable Island Bank | 17 | 19 | 127 | 530, 555 | 851, 125 | 11, 600 | 352, 065 | 16, 265 | 18, 510 | ---------- | 58, 528 | 6, 805 | 11, 669 |
| Horseshoe Ground | 63 | 188 | 1, 546 | 3, 343, 271 | 3, 221, 683 | 93, 881 | 8, 672, 833 | 309, 915 | 256, 931 | ---------- | 1, 432, 701 | 49, 074 | 65, 783 |
| Southwest Sable Island Bank | 44 | 92 | 624 | 1, 510, 277 | 1, 672, 560 | 60, 935 | 3, 591, 453 | 310, 620 | 49, 367 | 190 | 383, 055 | 5, 633 | 31, 366 |
| Eastern Nova Scotia | 12 | 13 | 72 | 37, 750 | 50, 980 | 4, 400 | 145, 365 | 12, 100 | 45, 260 | ---------- | 5, 915 | 16, 940 | 1, 209 |
| Emerald Bank | 54 | 130 | 955 | 1, 340, 646 | 1, 299, 715 | 72, 443 | 5, 949, 622 | 435, 294 | 266, 860 | ---------- | 698, 280 | 164, 170 | 52, 781 |
| Central Nova Scotia | 8 | 9 | 75 | 14, 170 | 16, 800 | ---------- | 34, 340 | 22, 520 | 40, 060 | ---------- | 1, 622 | 24, 200 | 168 |
| La Have Bank (including Sambro Bank) | 27 | 51 | 465 | 472, 047 | 530, 655 | 20, 500 | 527, 030 | 60, 513 | 372, 363 | ---------- | 46, 933 | 420, 915 | 137, 826 |
| Southern Nova Scotia | 66 | 237 | 1, 763 | 816, 744 | 759, 642 | 38, 745 | 1, 144, 003 | 196, 075 | 338, 656 | 7, 030 | 301, 270 | 351, 677 | 10, 909 |
| Browns Bank | 124 | 564 | 4, 529 | 3, 121, 337 | 3, 699, 368 | 127, 065 | 11, 645, 502 | 2, 219, 638 | 829, 625 | 5, 060 | 1, 774, 137 | 1, 027, 070 | 268, 258 |
| Western Nova Scotia | 47 | 96 | 873 | 697, 496 | 915, 207 | 24, 410 | 1, 019, 363 | 121, 185 | 575, 662 | 3, 115 | 329, 303 | 304, 102 | 18, 743 |
| Southern Bay of Fundy | 1 | 3 | 24 | 11, 250 | 8, 695 | ---------- | 70, 455 | 2, 020 | 12, 990 | ---------- | 895 | 14, 405 | 240 |
| Nova Scotia, unclassified | 32 | 46 | 525 | 551, 065 | 775, 660 | 75, 700 | 1, 147, 580 | 155, 245 | 187, 100 | ---------- | 201, 220 | 138, 450 | 17, 577 |
| Total | [1] 160 | 1, 783 | 15, 006 | 17, 615, 009 | 30, 836, 662 | 1, 809, 545 | 44, 281, 422 | 5, 099, 525 | 3, 223, 856 | 15, 395 | 5, 814, 886 | 2, 612, 925 | 1, 020, 616 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off New England (Area XXII): | | | | | | | | | | | | | |
| Eastern Maine | 3 | 5 | 53 | 8, 450 | 6, 580 | 480 | 23, 295 | 1, 260 | 7, 050 | 6, 900 | 4, 540 | 6, 220 | 1, 480 |
| Central Maine | 59 | 367 | 2, 548 | 219, 829 | 163, 369 | 5, 475 | 330, 474 | 9, 430 | 1, 497, 881 | 165, 555 | 132, 148 | 839, 147 | 3, 141 |
| Western Maine | 94 | 2, 685 | 3, 407 | 1, 682, 951 | 564, 441 | 16, 934 | 505, 104 | 11, 955 | 996, 340 | 369, 310 | 1, 960, 501 | 74, 660 | 2, 058 |
| Eastern Massachusetts | 190 | 6, 860 | 11, 986 | 2, 160, 024 | 1, 975, 994 | 159, 415 | 1, 045, 681 | 126, 902 | 1, 322, 133 | 1, 049, 232 | 12, 372, 751 | 95, 620 | 1, 285 |
| Inner Grounds | 131 | 700 | 3, 157 | 625, 338 | 645, 542 | 29, 600 | 2, 039, 507 | 92, 780 | 2, 115, 359 | 276, 595 | 483, 262 | 3, 503, 485 | 24, 065 |
| Western Side South Channel | 179 | 836 | 4, 846 | 1, 481, 154 | 1, 893, 424 | 69, 720 | 8, 284, 512 | 3, 134, 617 | 907, 623 | 62, 125 | 1, 170, 589 | 194, 792 | 21, 541 |
| Eastern Side South Channel | 106 | 398 | 2, 394 | 1, 124, 308 | 1, 279, 491 | 37, 545 | 6, 421, 584 | 1, 917, 539 | 1, 052, 308 | 650 | 1, 421, 931 | 443, 111 | 27, 054 |
| Northern Edge of Georges | 100 | 508 | 3, 216 | 2, 824, 740 | 9, 578, 034 | 406, 145 | 12, 435, 370 | 7, 773, 484 | 405, 733 | | 1, 510, 481 | 92, 396 | 73, 892 |
| Northeast Peak of Georges | 98 | 613 | 4, 612 | 6, 172, 997 | 11, 362, 110 | 525, 305 | 19, 426, 754 | 11, 575, 874 | 324, 332 | | 3, 118, 928 | 88, 702 | 84, 065 |
| Central Georges | 55 | 161 | 1, 011 | 533, 572 | 1, 056, 665 | 30, 700 | 3, 112, 566 | 1, 741, 197 | 37, 482 | | 212, 377 | 5, 366 | 15, 492 |
| Southeast Georges | 54 | 112 | 836 | 1, 210, 048 | 938, 610 | 18, 500 | 2, 667, 765 | 1, 947, 487 | 90, 808 | | 317, 805 | 4, 722 | 14, 359 |
| Southwest Georges | 33 | 52 | 490 | 30, 345 | 111, 800 | 1, 390 | 663, 390 | 254, 940 | 12, 405 | | 16, 372 | | 5, 196 |
| Lightship Grounds | 41 | 54 | 351 | 30, 760 | 80, 670 | | 506, 365 | 78, 305 | 9, 965 | 655 | 6, 375 | 15 | 469 |
| Nantucket Shoals | 20 | 38 | 165 | 34, 470 | 111, 885 | 1, 800 | 178, 140 | 103, 800 | 16, 760 | 2, 025 | 9, 460 | 600 | 1, 765 |
| Off No Mans Land | 60 | 122 | 514 | 8, 960 | 11, 530 | 200 | 28, 050 | 4, 800 | 14, 330 | | 3, 575 | 22, 575 | 708 |
| Southern Massachusetts | 5 | 8 | 25 | | | | | | 3, 300 | | | | |
| Rhode Island | 7 | 8 | 23 | | | | | | | | | | |
| Southern New England, unclassified | 39 | 52 | 396 | 206, 735 | 323, 540 | 28, 700 | 732, 190 | 374, 125 | 52, 886 | | 113, 338 | 28, 930 | 4, 363 |
| Total | [1] 368 | 13, 579 | 40, 030 | 18, 354, 681 | 30, 103, 685 | 1, 331, 909 | 58, 400, 747 | 29, 148, 495 | 8, 866, 695 | 1, 933, 047 | 22, 854, 433 | 5, 400, 341 | 280, 936 |
| Off Middle Atlantic States (Area XXIII), South | 30 | 40 | 198 | | | | | | | | | | |
| Grand total | [1] 373 | 15, 431 | 56, 057 | 37, 539, 038 | 61, 640, 848 | 3, 207, 537 | 102, 909, 169 | 34, 266, 100 | 12, 255, 169 | 1, 948, 442 | 28, 674, 406 | 8, 027, 037 | 2, 010, 363 |

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[1] Exclusive of duplication.

*Landings by fishing vessels at the three principal New England ports, 1937*—Continued

SUMMARY: BY FISHING AREAS—Continued

| Area | Mackerel | Flounders |  |  |  |  |  | Swordfish | Whiting | Wolffish | Rosefish | Herring | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Gray sole | Lemon sole | Yellowtail | Blackback | Dab | Other |  |  |  |  |  |  |  |
| Gulf of St. Lawrence (Area XIX): | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Treaty Coast |  |  |  |  |  |  |  |  |  |  |  |  |  | 516, 660 |
| Magdalen Islands | 338, 310 |  |  |  |  |  |  |  |  |  |  |  |  | 1, 802, 510 |
| Gulf of St. Lawrence, unclassified |  |  |  |  |  |  |  |  |  |  |  |  |  | 336, 741 |
| Newfoundland Banks (Area XX): |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Grand Bank |  |  |  |  |  |  |  | 3, 564 |  |  |  |  |  | 419, 594 |
| Green Bank |  |  |  |  |  |  |  | 567 |  |  |  |  |  | 109, 575 |
| St. Pierre Bank |  |  |  |  |  |  |  |  |  |  |  |  |  | 213, 153 |
| Newfoundland Banks, unclassified |  |  | 20 | 2, 400 |  | 500 |  |  |  | 100 | 20 |  |  | 420, 547 |
| Total | 338, 310 |  | 20 | 2, 400 |  | 500 |  | 4, 131 |  | 100 | 20 |  |  | 3, 818, 780 |
| Off Nova Scotia (Area XXI): |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Northeast Cape Breton | 770 |  |  |  |  |  |  | 103, 349 |  |  |  |  | 397 | 239, 197 |
| Misaine Bank |  | 3, 000 | 5, 000 |  |  | 4, 250 |  |  |  | 100 |  |  |  | 126, 001 |
| Banquereau |  | 80, 909 | 5, 367 | 298, 545 | 587 | 182, 812 | 87, 530 | 20, 826 |  | 83, 524 | 72, 640 |  | 2, 229 | 22, 233, 370 |
| Canso | 90, 375 |  |  |  |  |  |  |  |  |  |  |  |  | 90, 375 |
| Middle Ground | 138 | 419, 903 | 2, 997 | 346, 713 |  | 47, 872 | 42, 340 |  | 2, 200 | 58, 415 | 15, 303 |  | 2, 170 | 7, 739, 295 |
| Northeast Sable Island Bank | 137 | 32, 445 | 12, 868 | 69, 895 | 240 | 44, 941 | 31, 745 | 4, 765 |  | 79, 726 | 167, 710 |  | 307 | 8, 004, 657 |
| Southeast Sable Island Bank |  | 39, 295 | 6, 350 | 700 |  | 14, 517 | 33, 865 |  |  | 23, 255 | 28, 395 |  |  | 2, 003, 499 |
| Horseshoe Ground |  | 1, 528, 046 | 28, 488 | 159, 765 | 228 | 32, 136 | 118, 873 | 1, 301 | 1, 500 | 161, 582 | 81, 089 |  | 827 | 19, 562, 907 |
| Southwest Sable Island Bank |  | 88, 954 | 13, 394 | 24, 776 | 340 | 21, 477 | 14, 793 |  |  | 155, 347 | 53, 184 |  | 188 | 7, 987, 909 |
| Eastern Nova Scotia | 196, 470 | 62, 490 | 180 |  |  | 395 | 700 |  |  | 1, 530 | 6, 488 |  | 22 | 588, 194 |
| Emerald Bank |  | 458, 620 | 7, 893 | 27, 649 | 10 | 48, 411 | 46, 548 | 312 |  | 194, 826 | 18, 525 |  | 656 | 11, 083, 261 |
| Central Nova Scotia | 166, 395 | 450 | 270 | 2, 280 |  | 1, 400 |  |  |  | 340 |  |  |  | 325, 015 |
| La Have Bank (including Sambro Bank) |  | 4, 268 | 855 | 1, 800 | 50 | 1, 335 |  | 6, 279 |  | 16, 940 | 62, 507 |  |  | 2, 682, 816 |
| Southern Nova Scotia |  | 444, 207 | 13, 220 | 4, 345 | 400 | 86, 394 | 21, 297 | 4, 983 | 280 | 62, 218 | 12, 005, 965 |  | 998 | 16, 609, 058 |
| Browns Bank | 36, 913 | 426, 787 | 49, 478 | 56, 413 | 3, 700 | 151, 362 | 32, 729 | 373, 894 | 2, 490 | 317, 258 | 11, 522, 904 |  | 3, 885 | 37, 694, 873 |
| Western Nova Scotia |  | 64, 517 | 665 | 27, 705 | 1, 070 | 16, 497 | 290 | 2, 971 |  | 31, 083 | 1, 961, 505 |  |  | 6, 114, 889 |
| Southern Bay of Fundy |  |  |  |  |  |  |  |  |  |  |  |  |  | 120, 950 |
| Nova Scotia, unclassified |  | 107, 630 | 3, 140 | 78, 500 |  | 3, 590 | 20, 130 | 6, 946 |  | 26, 840 | 263, 081 |  |  | 3, 759, 454 |
| Total | 491, 198 | 3, 761, 521 | 150, 165 | 1, 099, 086 | 6, 625 | 657, 389 | 450, 840 | 525, 626 | 6, 470 | 1, 212, 984 | 26, 262, 296 |  | 11, 679 | 146, 965, 720 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off New England (Area XXII): | | | | | | | | | | | | | | |
| Eastern Maine | | 8,000 | | | | 500 | 900 | | | | | 1,000 | | 76,655 |
| Central Maine | 371,702 | 415,355 | 1,185 | 31,930 | 30,232 | 118,080 | 5,565 | | 3,000 | 14,960 | 113,600 | 200 | 11,186 | 4,483,447 |
| Western Maine | 106,763 | 942,233 | 27,465 | 85,370 | 45,742 | 197,886 | 19,019 | 139 | 322,044 | 14,024 | 784,078 | 37 | 49,217 | 8,778,271 |
| Eastern Massachusetts | 3,002,645 | 1,182,675 | 7,975 | 1,099,307 | 421,890 | 689,930 | 6,415 | 185 | 5,653,037 | 86,525 | 572,218 | 5,275 | 370,234 | 33,407,348 |
| Inner Grounds | 86,440 | 380,608 | 1,195 | 49,345 | 16,700 | 98,757 | 65 | | 94,815 | 13,113 | 2,674,093 | | 7,828 | 13,258,492 |
| Western Side South Channel | 657,987 | 553,901 | 211,312 | 118,600 | 216,199 | 180,028 | 16,253 | 5,936 | 350,160 | 74,477 | 20,531,431 | | 39,408 | 40,175,822 |
| Eastern Side South Channel | 450 | 342,777 | 271,670 | 80,555 | 76,873 | 420,173 | 74,560 | 2,657 | 43,214 | 95,037 | 6,441,140 | | 5,642 | 21,580,299 |
| Northern Edge of Georges | 8,141 | 105,381 | 498,772 | 127,436 | 68,492 | 119,426 | 41,134 | 55,244 | 38,836 | 188,711 | 236,841 | | 15,115 | 36,603,804 |
| Northeast Peak of Georges | 28,155 | 62,976 | 453,029 | 114,044 | 40,200 | 42,135 | 48,674 | 83,403 | 3,585 | 251,489 | 240,999 | | 22,571 | 54,070,327 |
| Central Georges | 175 | 26,855 | 535,786 | 165,823 | 101,690 | 16,763 | 28,654 | | 4,511 | 23,038 | 4,720 | | 933 | 7,654,365 |
| Southeast Georges | 4,735 | 18,810 | 58,223 | 42,668 | 7,065 | 15,127 | 9,685 | 79,499 | | 16,913 | 720 | | 12,871 | 7,476,420 |
| Southwest Georges | | 1,290 | 181,376 | 14,921 | 41,272 | 2,180 | 10,025 | 199,218 | | 2,080 | 6,520 | | 4,650 | 1,559,370 |
| Lightship Grounds | 390,885 | 4,308 | 9,480 | 78,905 | 5,865 | 5,360 | 875 | 75,808 | | 775 | 193,976 | | 375 | 1,480,191 |
| Nantucket Shoals | 64,075 | 6,277 | 14,538 | 466,545 | 17,099 | 500 | 8,365 | 502 | 600 | 2,220 | 6,500 | | 11,555 | 1,059.481 |
| Off No Mans Land | 2,310,710 | 7,520 | | 459,890 | 140 | 620 | 3,775 | 10,397 | 17,300 | 1,300 | 49,950 | | 18,535 | 2,974,865 |
| Southern Massachusetts | 34,075 | | | 89,100 | | | | | | | | | 285 | 126,760 |
| Rhode Island | 282,140 | | | | | | | | | | | | | 282,140 |
| Southern New England, unclassified | | 25,295 | 43,703 | 17,760 | 10,340 | 6,915 | 1,975 | 47,512 | 1,200 | 7,654 | 208,117 | | 500 | 2,235,778 |
| Total | 7,349,078 | 4,084,261 | 2,315,739 | 3,042,199 | 1,099,799 | 1,914,380 | 275,939 | 560,500 | 6,532,332 | 792,316 | 32,064,903 | 6,512 | 570,905 | 237,283,835 |
| Off Middle Atlantic States (Area XXIII), South | 1,124,035 | | | | | | | 34,163 | | | | | 1,710 | 1,159,908 |
| Grand total | 9,302,621 | 7,845,785 | 2,465,924 | 4,143,685 | 1,106,424 | 2,572,269 | 726,779 | 1,124,420 | 6,538,802 | 2,005,400 | 58,327,219 | 6,512 | 584,294 | 389,228,243 |

NOTE.—The weight of salted fish landed has been converted to the equivalent of fresh fish as landed. The roman numerals appearing in the stub of the above table refer to the numbers given these regions by the North American Council on Fishery Investigations.

## MACKEREL FISHERY OF THE ATLANTIC COAST[5]

The mackerel season of 1937 extended from April 12, 1937, to January 13, 1938. Ninety-six vessels landed 13,997,200 pounds, which represents a decrease of 65 percent as compared with corresponding landings of the preceding year.

Of the total landings, about 1,000,000 pounds were tinkers (fish under 1 pound) while the remainder were of larger sizes. The tinkers were caught between July 1 and October 31.

The fishery was unusual because of its small yield (one of the lowest since the fishery began) and the comparative failure of the Gulf of Maine region. The season was unique in that it was the first to extend into January.

In this analysis, vessels include United States craft of 5 net tons capacity or over. Vessels are classed as "regular" and "miscellaneous" on the basis of their effort throughout the whole mackerel season. Regular seiners fished in all three major areas and were active for more than two-thirds the duration of the Gulf of Maine fishery. Miscellaneous seiners are those who did not fish in the Southern area, or ceased seining activity for three months or more during the time of Gulf of Maine fishery. All netters are considered miscellaneous, inasmuch as each one enters the mackerel fishery for only a portion of the year. Craft using purse seines may change gear and engage in netting for a portion of the season, and during this time are classed as netters. Allowance for such duplication has been made in the summary "Operating Units and Catch."

Division of the whole mackerel season into three periods is determined by the gill-net fishery. The end of the early netting season terminates the period "Spring." Resumption of netting in the fall marks the beginning of the period "Fall and Winter." "Summer" is included between these two periods.

*Mackerel fishery of the Atlantic coast, 1937* [1]

CATCH: BY AREAS IN 5-DAY PERIODS

| Date | South (Area XXIII) | | Block Island (Area XXII west of Nantucket Shoals) | | Gulf of Maine (Area XXII north of Nantucket Shoals) | | Nova Scotia (Area XXI) | Total |
|---|---|---|---|---|---|---|---|---|
| | Seiners | Netters | Seiners | Netters | Seiners | Netters | Seiners | |
| SPRING | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Apr. 11-15 | 130, 700 | | | | | | | 130, 700 |
| Apr. 16-20 | 281, 800 | 3, 700 | | | | | | 285, 500 |
| Apr. 21-25 | 573, 500 | 9, 800 | | | | | | 583, 300 |
| Apr. 26-30 | | 9, 000 | | | | | | 9, 000 |
| May 1-5 | 93, 200 | 68, 100 | | | | | | 161, 300 |
| May 6-10 | 579, 800 | 47, 800 | | | | | | 627, 600 |
| May 11-15 | 728, 100 | 71, 200 | 134, 300 | | | | | 933, 600 |
| May 16-20 | 231, 900 | 51, 900 | 1, 277, 100 | 1, 400 | | | | 1, 562, 300 |
| May 21-25 | | 15, 000 | 827, 300 | 10, 100 | | | | 852, 400 |
| May 26-31 | | | 421, 000 | 600 | | 3, 400 | | 425, 000 |
| June 1-5 | | | 307, 800 | 9, 300 | | 5, 000 | 137, 600 | 459, 700 |
| June 6-10 | | | 527, 600 | 5, 800 | 25, 000 | 3, 500 | 167, 700 | 729, 600 |

[1] Includes the catch made between Jan. 1 and 15, 1938.

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[5] This section, prepared by J. R. Webster of the Division of Scientific Inquiry, includes landings at Cape May and Wildwood, N. J.; New York, N. Y.; Newport and Block Island, R. I.; New Bedford, Buzzards Bay (Cape Cod Canal), Provincetown, Plymouth, Boston, and Gloucester, Mass.; and Portland, Maine; by purse-seine vessels or "seiners" and drift-gill-net vessels or "netters". It does not include incidental catches by other vessels such as menhaden seiners, otter trawlers, line trawlers, etc., or by traps.

## *Mackerel fishery of the Atlantic coast, 1937*—Continued

CATCH: BY AREAS IN 5-DAY PERIODS—Continued

| Date | South (Area XXIII) | | Block Island (Area XXII west of Nantucket Shoals) | | Gulf of Maine (Area XXII north of Nantucket Shoals) | | Nova Scotia (Area XXI) | Total |
|---|---|---|---|---|---|---|---|---|
| | Seiners | Netters | Seiners | Netters | Seiners | Netters | Seiners | |
| SPRING—contd. | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| June 11-15 | | | 143, 900 | 7, 100 | 18, 300 | 3, 500 | 158, 300 | 331, 100 |
| June 16-20 | | | | 100 | 130, 000 | 4, 000 | | 134, 100 |
| June 21-25 | | | | 100 | 16, 800 | 1, 900 | 31, 500 | 50, 300 |
| June 26-30 | | | | | 12, 400 | 400 | | 12, 800 |
| July 1-5 | | | | | 112, 100 | 100 | | 112, 200 |
| SUMMER | | | | | | | | |
| July 6-10 | | | | | 51, 400 | | | 51, 400 |
| July 11-15 | | | | | 420, 300 | | | 420, 300 |
| July 16-20 | | | | | 314, 800 | | | 314, 800 |
| July 21-25 | | | | | 259, 200 | | | 259, 200 |
| July 26-31 | | | | | 265, 800 | | | 265, 800 |
| Aug. 1-5 | | | | | 134, 000 | | | 134, 000 |
| Aug. 6-10 | | | | | 31, 300 | | | 31, 300 |
| Aug. 11-15 | | | | | 29, 100 | | | 29, 100 |
| Aug. 16-20 | | | | | 94, 100 | | | 94, 100 |
| Aug. 21-25 | | | | | 57, 000 | | | 57, 000 |
| Aug. 26-31 | | | | 300 | 175, 300 | | | 175, 600 |
| Sept. 1-5 | | | | 200 | 48, 700 | | | 48, 900 |
| Sept. 6-10 | | | | 100 | 16, 400 | | | 16, 500 |
| Sept. 11-15 | | | | | 150, 300 | | | 150, 300 |
| Sept. 16-20 | | | | | 102, 300 | | | 102, 300 |
| Sept. 21-25 | | | | | 148, 800 | | | 148, 800 |
| Sept. 26-30 | | | | | 47, 700 | | | 47, 700 |
| FALL AND WINTER | | | | | | | | |
| Oct. 1-5 | | | | | 728, 200 | 800 | | 729, 000 |
| Oct. 6-10 | | | | | 47, 700 | 200 | | 47, 900 |
| Oct. 11-15 | | | | | 14, 700 | 100 | | 14, 800 |
| Oct. 16-20 | | | | | 100 | 100 | | 200 |
| Oct. 21-25 | | | | | | 800 | 800 | 1, 600 |
| Oct. 26-31 | | | | | 6, 900 | 800 | | 7, 700 |
| Nov. 1-5 | | | 219, 000 | | | 300 | | 219, 300 |
| Nov. 6-10 | | | 69, 600 | | | 1, 000 | | 70, 600 |
| Nov. 11-15 | | | 400, 000 | | 8, 000 | 14, 500 | | 422, 500 |
| Nov. 16-20 | | | | | | 213, 300 | | 213, 300 |
| Nov. 21-25 | | | 5, 200 | | 77, 600 | 210, 400 | | 293, 200 |
| Nov. 26-30 | 62, 200 | | 96, 900 | | 109, 000 | 310, 000 | | 578, 100 |
| Dec. 1-5 | 673, 300 | | | | | 185, 900 | | 859, 200 |
| Dec. 6-10 | 45, 400 | | | | | 259, 800 | | 305, 200 |
| Dec. 11-15 | 147, 800 | | | | | 45, 200 | | 193, 000 |
| Dec. 16-20 | | | | | | 36, 900 | | 36, 900 |
| Dec. 21-25 | 4, 000 | | | | | 22, 300 | | 26, 300 |
| Dec. 26-31 | 19, 000 | | | | | 6, 700 | | 25, 700 |
| Jan. 1-5 | 25, 000 | | | | | | | 25, 000 |
| Jan. 6-10 | 81, 000 | | | | | | | 81, 000 |
| Jan. 11-15 | 99, 100 | | | | | | | 99, 100 |
| Total | 3, 775, 800 | 276, 500 | 4, 429, 700 | 35, 100 | 3, 653, 300 | 1, 330, 900 | 495, 900 | 13, 997, 200 |

NOTE.—The roman numerals appearing in the box heads of the above table refer to the numbers given these areas by the North American Council on Fishery Investigations.

### *Mackerel fishery of the Atlantic coast, 1937*—Continued

OPERATING UNITS AND CATCH: BY GEAR CLASSIFICATION AND GROUNDS

[Vessels of 5 net tons and over]

| Designation | Vessels | Tonnage | Crew | Trips | Total catch |
|---|---|---|---|---|---|
| SOUTH—AREA XXIII | | | | | |
| Seiners: | | | | | |
| Spring: | *Number* | *Net tons* | *Number* | *Number* | *Pounds* |
| Regular vessels | 27 | 1,111 | 351 | 114 | 1,904,800 |
| Miscellaneous vessels | 15 | 586 | 178 | 46 | 714,200 |
| Fall and winter: | | | | | |
| Regular vessels | 19 | 775 | 250 | 37 | 1,011,800 |
| Miscellaneous vessels | 6 | 229 | 75 | 13 | 145,000 |
| Netters: | | | | | |
| Spring | 5 | 114 | 33 | 26 | 276,500 |
| Total | [1] 47 | [1] 1,862 | [1] 581 | 236 | 4,052,300 |
| BLOCK ISLAND | | | | | |
| (Area XXII west of Nantucket Shoals) | | | | | |
| Seiners: | | | | | |
| Spring: | | | | | |
| Regular vessels | 26 | 1,097 | 339 | 103 | 2,053,000 |
| Miscellaneous vessels | 24 | 851 | 293 | 68 | 1,586,000 |
| Fall and winter: | | | | | |
| Regular vessels | 21 | 926 | 277 | 40 | 790,700 |
| Netters: | | | | | |
| Spring | 6 | 128 | 38 | 22 | 34,500 |
| Summer | 1 | 14 | 5 | 5 | 600 |
| Total | [1] 55 | [1] 2,058 | [1] 663 | 238 | 4,464,800 |
| GULF OF MAINE | | | | | |
| (Area XXII north of Nantucket Shoals) | | | | | |
| Seiners: | | | | | |
| Spring: | | | | | |
| Regular vessels | 18 | 718 | 231 | 29 | 127,900 |
| Miscellaneous vessels | 27 | 698 | 276 | 51 | 186,700 |
| Summer: | | | | | |
| Regular vessels | 27 | 1,111 | 351 | 227 | 1,515,900 |
| Miscellaneous vessels | 34 | 713 | 315 | 247 | 830,600 |
| Fall and winter: | | | | | |
| Regular vessels | 25 | 1,049 | 326 | 77 | 820,000 |
| Miscellaneous vessels | 14 | 267 | 129 | 25 | 172,200 |
| Netters: | | | | | |
| Spring | 6 | 76 | 33 | 33 | 21,800 |
| Fall and winter | 27 | 482 | 188 | 262 | 1,309,100 |
| Total | [1] 88 | [1] 2,375 | [1] 893 | 951 | 4,984,200 |
| NOVA SCOTIA—AREA XXI | | | | | |
| Seiners: | | | | | |
| Spring: | | | | | |
| Regular vessels | 4 | 209 | 55 | 6 | 211,200 |
| Miscellaneous vessels | 5 | 254 | 69 | 7 | 283,900 |
| Fall: | | | | | |
| Miscellaneous vessels | 1 | 62 | 16 | 1 | 800 |
| Total | [1] 9 | [1] 463 | [1] 124 | 14 | 495,900 |
| SUMMARY | | | | | |
| Seiners: | | | | | |
| Regular | [1] 27 | [1] 1,111 | [1] 351 | 634 | 8,435,300 |
| Miscellaneous | [1] 48 | [1] 1,234 | [1] 487 | 457 | 3,919,400 |
| Netters | [1] 33 | [1] 588 | [1] 223 | 348 | 1,642,500 |
| Grand total | [1] 96 | [1] 2,704 | [1] 980 | 1,439 | 13,997,200 |

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[1] Exclusive of duplication.

## FISHERIES OF THE MIDDLE ATLANTIC STATES

### (Area XXIII)[6]

The yield of the commercial fisheries of the Middle Atlantic States (New York, New Jersey, Pennsylvania, and Delaware) during 1937 amounted to 264,651,900 pounds, valued at $7,895,990 to the fishermen, representing a decrease of 5 percent in volume but an increase of 23 percent in value as compared with the catch in 1935, the most recent previous year for which catch statistics are available. These fisheries gave employment to 7,720 fishermen, as compared with 9,620 in 1935.

There were 419 fishery wholesale and manufacturing establishments in the 4 States in 1937 as compared with 408 in 1935 when the most recent previous survey was made. In 1937 these establishments employed 6,839 persons, paid $8,611,693 in salaries and wages, and produced manufactured products (canned, cured, packaged, and byproducts), valued at $18,658,605. In 1935 the wholesale and manufacturing firms employed 6,143 persons, paid $6,666,507 in salaries and wages, and produced manufactured products valued at $13,441,812.

*Fisheries of the Middle Atlantic States, 1937*

SUMMARY OF CATCH

| Product | New York | | New Jersey | | Pennsylvania | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Fish | 64, 882, 400 | $1, 531, 483 | 115, 471, 800 | $1, 899, 388 | 34, 700 | $4, 632 |
| Shellfish, etc | 19, 278, 100 | 2, 839, 563 | 14, 044, 400 | 1, 301, 570 | | |
| Total | 84, 160, 500 | 4, 371, 046 | 129, 516, 200 | 3, 200, 958 | 34, 700 | 4, 632 |

| Product | Delaware | | Total | |
|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* |
| Fish | 49, 804, 600 | $264, 769 | 230, 193, 500 | $3, 700, 272 |
| Shellfish, etc | 1, 135, 900 | 54, 585 | 34, 458, 400 | 4, 195, 718 |
| Total | 50, 940, 500 | 319, 354 | 264, 651, 900 | 7, 895, 990 |

OPERATING UNITS: BY STATES

| Item | New York | New Jersey | Pennsylvania | Delaware | Total |
|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 1, 158 | 1, 132 | | 337 | 2, 627 |
| On boats and shore: | | | | | |
| Regular | 1, 104 | 992 | | 25 | 2, 121 |
| Casual | 1, 027 | 1, 581 | 34 | 330 | 2, 972 |
| Total | 3, 289 | 3, 705 | 34 | 692 | 7, 720 |
| Vessels: | | | | | |
| Steam | 1 | | | 9 | 10 |
| Net tonnage | 45 | | | 1, 167 | 1, 212 |
| Motor | 244 | 187 | | 7 | 438 |
| Net tonnage | 3, 989 | 3, 197 | | 138 | 7, 324 |
| Sail | | 3 | | | 3 |
| Net tonnage | | 32 | | | 32 |
| Total vessels | 215 | 190 | | 16 | 451 |
| Total net tonnage | 4, 034 | 3, 229 | | 1, 305 | 8, 568 |

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[6] This is the number given to this area by the North American Council on Fishery Investigations. It should be explained that there are included in this area craft whose principal fishing ports are in the area but at times fish elsewhere. A notable example is the southern trawl fishery which extends into area XXIV. It should be observed that the persons engaged, gear and craft employed, and catch of the seed-oyster fishery are not included among the statistics of the fishery for market oysters and other species but are shown in separate tables in this section. For a clearer understanding of the statistics published in this section, the reader is referred to the section in the latter part of this document entitled "Statistical survey procedure."

## *Fisheries of the Middle Atlantic States, 1937*—Continued

OPERATING UNITS: BY STATES—Continued

| Item | New York | New Jersey | Pennsylvania | Delaware | Total |
|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* |
| Boats: | | | | | |
| Motor | 511 | 971 | | 22 | 1, 504 |
| Other | 808 | 1, 317 | 8 | 128 | 2, 261 |
| Accessory boats | 125 | 71 | | 27 | 223 |
| Apparatus: | | | | | |
| Purse seines: | | | | | |
| Mackerel | 3 | | | | 3 |
| Length, yards | 1, 330 | | | | 1, 330 |
| Menhaden | 9 | 6 | | 9 | 24 |
| Length, yards | 3, 530 | 1, 680 | | 4, 335 | 9, 545 |
| Other | 1 | 8 | 8 | | 17 |
| Length, yards | 400 | 2, 790 | 1, 650 | | 4, 840 |
| Haul seines | 71 | 121 | | 47 | 239 |
| Length, yards | 13, 625 | 9, 573 | | 11, 715 | 34, 913 |
| Gill nets: | | | | | |
| Anchor | 11 | 6 | | | 17 |
| Square yards | 666 | 9, 340 | | | 10, 006 |
| Drift | 189 | 678 | | 26 | 893 |
| Square yards | 596, 986 | 470, 822 | | 51, 925 | 1, 119, 733 |
| Runaround | 4 | 52 | | 10 | 66 |
| Square yards | 9, 840 | 189, 590 | | 8, 210 | 207, 640 |
| Stake | 354 | 579 | | 27 | 960 |
| Square yards | 88, 936 | 219. 175 | | 14, 180 | 322, 291 |
| Lines: | | | | | |
| Hand | 105 | 444 | | 8 | 557 |
| Hooks | 105 | 885 | | 16 | 1, 006 |
| Trawl | 3, 894 | 566 | | 1 | 4, 461 |
| Hooks | 248, 660 | 373, 000 | | 3, 000 | 624, 660 |
| Troll | | 482 | | | 482 |
| Hooks | | 482 | | | 482 |
| Trot with baits or snoods | 72 | 21 | | | 93 |
| Baits or snoods | 44, 000 | 14, 806 | | | 58, 806 |
| Trot with hooks | 14 | 1 | | | 15 |
| Hooks | 2, 385 | 150 | | | 2, 535 |
| Pound nets | 136 | 191 | | 17 | 344 |
| Weirs | | 91 | | | 91 |
| Stop nets | | 59 | | 11 | 70 |
| Square yards | | 63, 317 | | 1, 580 | 64, 897 |
| Fyke nets | 573 | 832 | | 233 | 1, 638 |
| Dip nets | 36 | 28 | | 67 | 131 |
| Cast nets | | 3 | | 1 | 4 |
| Drag nets | | 12 | | | 12 |
| Yards at mouth | | 24 | | | 24 |
| Drop nets | | 40 | | | 40 |
| Push nets | | 13 | | | 13 |
| Otter trawls: | | | | | |
| Fish | 152 | 60 | | | 212 |
| Yards at mouth | 3, 108 | 1, 367 | | | 4, 475 |
| Shrimp | 1 | | | | 1 |
| Yards at mouth | 23 | | | | 23 |
| Wire baskets | | 25 | | | 25 |
| Eel traps | 60 | | | | 60 |
| Pots: | | | | | |
| Crab | | 10 | | | 10 |
| Eel | 1, 488 | 1, 476 | | 340 | 3, 304 |
| Fish | 1, 110 | 10, 047 | | | 11, 157 |
| Lobster | 13, 850 | 9, 699 | | 115 | 23, 664 |
| Harpoons | 13 | | | | 13 |
| Spears | 56 | 40 | | | 96 |
| Dredges: | | | | | |
| Clam | 42 | 72 | | 10 | 124 |
| Yards at mouth | 42 | 74 | | 12 | 128 |
| Crab | 7 | 58 | | 8 | 73 |
| Yards at mouth | 12 | 84 | | 10 | 106 |
| Mussel | 2 | | | | 2 |
| Yards at mouth | 2 | | | | |
| Oyster: | | | | | |
| Common | 104 | 176 | | 10 | 290 |
| Yards at mouth | 145 | 214 | | 14 | 373 |
| Suction | 1 | | | | 1 |
| Yards at mouth | 2 | | | | 2 |
| Scallop | 72 | 6 | | | 78 |
| Yards at mouth | 244 | 20 | | | 264 |
| Tongs: | | | | | |
| Oyster | 313 | 187 | | | 500 |
| Other | 1, 287 | 572 | | 3 | 1, 862 |
| Rakes: | | | | | |
| Oyster | | 34 | | | 34 |
| Other | 177 | 871 | | | 1, 048 |
| Forks | 402 | | | | 402 |
| Hoes | | 101 | | | 101 |

## *Fisheries of the Middle Atlantic States, 1937*—Continued

### CATCH: BY STATES

| Species | New York | | New Jersey | | Pennsylvania | | Delaware | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 221, 800 | $3, 889 | 423, 100 | $4, 222 | | | 69, 900 | $1, 402 | 714, 800 | $9, 513 |
| Bluefish | 858, 100 | 68, 392 | 1, 484, 300 | 101, 623 | | | 5, 500 | 385 | 2, 347, 900 | 170, 400 |
| Bonito | 50, 400 | 2, 061 | 174, 400 | 7, 442 | | | | | 224, 800 | 9, 503 |
| Butterfish | 1, 900, 200 | 112, 465 | 3, 055, 700 | 116, 875 | | | | | 4, 955, 900 | 229, 340 |
| Carp | 135, 700 | 9, 466 | 323, 900 | 22, 824 | 3, 500 | $210 | 44, 800 | 3, 584 | 507, 900 | 36, 084 |
| Catfish and bullheads | 24, 100 | 2, 479 | 60, 200 | 2, 446 | | | 30, 800 | 927 | 115, 100 | 5, 852 |
| Cero | | | 51, 100 | 1, 272 | | | | | 51, 100 | 1, 272 |
| Cod | 3, 802, 500 | 153, 818 | 2, 564, 900 | 67, 815 | | | 48, 000 | 1, 680 | 6, 415, 400 | 223, 313 |
| Croaker | 29, 900 | 315 | 3, 934, 300 | 67, 443 | | | 271, 800 | 3, 216 | 4, 236, 000 | 70, 974 |
| Cusk | 90, 900 | 1, 283 | | | | | | | 90, 900 | 1, 283 |
| Drum: | | | | | | | | | | |
| Black | | | 5, 100 | 73 | | | | | 5, 100 | 73 |
| Red or redfish | 100 | 1 | 10, 100 | 200 | | | | | 10, 200 | 201 |
| Eels: | | | | | | | | | | |
| Common | 172, 400 | 10, 075 | 272, 400 | 26, 307 | | | 33, 600 | 4, 928 | 478, 400 | 41, 310 |
| Conger | 1, 000 | 22 | 31, 000 | 520 | | | | | 32, 000 | 542 |
| Flounders: | | | | | | | | | | |
| Gray sole | 89, 100 | 6, 261 | 5, 100 | 163 | | | | | 94, 200 | 6, 424 |
| Lemon sole | 145, 800 | 9, 610 | | | | | | | 145, 800 | 9, 610 |
| Yellowtail and dab | 2, 817, 000 | 126, 579 | 13, 800 | 367 | | | | | 2, 830, 800 | 126, 946 |
| Blackback | 2, 736, 800 | 145, 876 | 134, 500 | 5, 077 | | | | | 2, 871, 300 | 150, 953 |
| Fluke | 2, 098, 300 | 104, 113 | 2, 152, 200 | 171, 907 | | | | | 4, 250, 500 | 276, 020 |
| Unclassified | 679, 100 | 33, 953 | | | | | 4, 200 | 214 | 683, 300 | 34, 167 |
| Frigate mackerel | 26, 500 | 265 | 158, 200 | 1, 925 | | | | | 184, 700 | 2, 190 |
| Gizzard shad | | | | | | | 500 | 10 | 500 | 10 |
| Grayfish | 100 | 2 | 57, 600 | 543 | | | | | 57, 700 | 545 |
| Groupers | | | 21, 500 | 978 | | | | | 21, 500 | 978 |
| Haddock | 2, 281, 900 | 75, 757 | | | | | | | 2, 281, 900 | 75, 757 |
| Hake | 317, 200 | 4, 107 | 49, 500 | 1, 437 | | | | | 366, 700 | 5, 544 |
| Halibut | 2, 800 | 291 | | | | | | | 2, 800 | 291 |
| Herring, sea | 4, 600 | 46 | 365, 900 | 3, 500 | | | | | 370, 500 | 3, 546 |
| Hickory shad | | | 2, 000 | 32 | | | | | 2, 000 | 32 |
| Kingfish or "king mackerel" | | | 149, 500 | 5, 677 | | | | | 149, 500 | 5, 677 |
| King whiting or "kingfish" | 72, 600 | 893 | 78, 300 | 3, 048 | | | | | 150, 900 | 3, 941 |
| Mackerel | 1, 447, 900 | 35, 078 | 1, 669, 100 | 59, 393 | | | | | 3, 117, 000 | 94, 471 |
| Menhaden | 31, 892, 000 | 164, 431 | 67, 756, 000 | 264, 315 | | | 48, 857, 000 | 227, 831 | 148, 505, 000 | 656, 577 |
| Mullet | | | 500 | 14 | | | 64, 400 | 2, 582 | 64, 900 | 2, 596 |
| Mummichog | 1, 300 | 140 | | | | | | | 1, 300 | 140 |
| Pigfish | | | 100 | 2 | | | | | 100 | 2 |
| Pollock | 116, 100 | 3, 018 | 1, 500 | 45 | | | | | 117, 600 | 3, 063 |
| Pompano | | | 100 | 35 | | | | | 100 | 35 |

## *Fisheries of the Middle Atlantic States, 1937*—Continued

CATCH: BY STATES—Continued

| Species | New York |  | New Jersey |  | Pennsylvania |  | Delaware |  | Total |  |
|---|---|---|---|---|---|---|---|---|---|---|
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Rosefish | 1, 500 | $15 |  |  |  |  |  |  | 1, 500 | $15 |
| Rudderfish |  |  | 2, 100 | $21 |  |  |  |  | 2, 100 | 21 |
| Scup or porgy | 1, 707, 100 | 50, 449 | 5, 044, 800 | 84, 718 |  |  |  |  | 6, 751, 900 | 135, 167 |
| Sea bass | 527, 400 | 38, 557 | 2, 111, 300 | 115, 834 |  |  |  |  | 2, 638, 700 | 154, 391 |
| Sea robin | 16, 000 | 325 | 55, 400 | 597 |  |  |  |  | 71, 400 | 922 |
| Shad | 1, 021, 400 | 76, 863 | 3, 339, 500 | 322, 730 | 12, 600 | $3, 522 | 20, 500 | $3, 247 | 4, 394, 000 | 406, 362 |
| Sharks | 22, 200 | 1, 137 | 43, 700 | 690 |  |  |  |  | 65, 900 | 1, 827 |
| Skates | 63, 300 | 642 | 57, 700 | 437 |  |  |  |  | 121, 000 | 1, 079 |
| Smelt | 600 | 76 |  |  |  |  |  |  | 600 | 76 |
| Snapper, red |  |  | 53, 900 | 3, 794 |  |  |  |  | 53, 900 | 3, 794 |
| Spanish mackerel | 100 | 2 | 50, 300 | 4, 200 |  |  |  |  | 50, 400 | 4, 202 |
| Spot | 300 | 5 | 14, 800 | 310 |  |  | 3, 000 | 150 | 18, 100 | 465 |
| Squeteagues or "sea trout," gray | 1, 457, 100 | 58, 711 | 10, 515, 200 | 290, 849 |  |  | 292, 100 | 8, 763 | 12, 264, 400 | 358, 323 |
| Squirrel hake | 5, 000 | 98 | 115, 200 | 1, 162 |  |  |  |  | 120, 200 | 1, 260 |
| Striped bass | 132, 000 | 11, 702 | 241, 200 | 31, 738 |  |  | 31, 800 | 3, 548 | 405, 000 | 46, 988 |
| Sturgeon | 1, 200 | 275 | 6, 300 | 645 |  |  | 400 | 74 | 7, 900 | 994 |
| Suckers | 29, 900 | 1, 986 | 21, 100 | 1, 090 | 18, 600 | 900 |  |  | 69, 600 | 3, 976 |
| Sunfish | 1, 600 | 93 |  |  |  |  |  |  | 1, 600 | 93 |
| Swellfish | 56, 100 | 579 | 100 | 1 |  |  |  |  | 56, 200 | 580 |
| Swordfish | 109, 000 | 20, 216 |  |  |  |  |  |  | 109, 000 | 20, 216 |
| Tautog | 5, 900 | 80 | 14, 200 | 289 |  |  | 1, 100 | 33 | 21, 200 | 402 |
| Thimble-eyed mackerel | 47, 900 | 1, 477 | 15, 100 | 275 |  |  |  |  | 63, 000 | 1, 752 |
| Tilefish | 2, 389, 600 | 101, 864 | 300 | 15 |  |  |  |  | 2, 389, 900 | 101, 879 |
| Tomcod | 3, 100 | 120 |  |  |  |  |  |  | 3, 100 | 120 |
| Tuna | 43, 400 | 2, 218 | 50, 700 | 1, 748 |  |  |  |  | 94, 100 | 3, 966 |
| White perch |  |  | 82, 900 | 8, 236 |  |  | 19, 000 | 1, 893 | 101, 900 | 10, 129 |
| Whiting | 5, 189, 200 | 87, 117 | 8, 623, 700 | 91, 809 |  |  |  |  | 13, 812, 900 | 178, 926 |
| Wolffish | 5, 800 | 139 |  |  |  |  |  |  | 5, 800 | 139 |
| Yellow perch | 29, 500 | 2, 051 | 5, 700 | 666 |  |  | 6, 200 | 302 | 41, 400 | 3, 019 |
| Yellowtail |  |  | 700 | 14 |  |  |  |  | 700 | 14 |
| Total | 64, 882, 400 | 1, 531, 483 | 115, 471, 800 | 1, 899, 388 | 34, 700 | 4, 632 | 49, 804, 600 | 264, 769 | 230, 193, 500 | 3, 700, 272 |
| SHELLFISH, ETC. |  |  |  |  |  |  |  |  |  |  |
| Crabs: |  |  |  |  |  |  |  |  |  |  |
| Hard | 511, 100 | 11, 350 | 635, 600 | 21, 904 |  |  | 264, 400 | 4, 708 | 1, 411, 100 | 37, 962 |
| Soft and peelers | 12, 500 | 2, 500 | 59, 600 | 20, 081 |  |  | 78, 500 | 14, 894 | 150, 600 | 37, 475 |
| King |  |  | 2, 766, 500 | 7, 221 |  |  | 489, 000 | 854 | 3, 255, 500 | 8, 075 |
| Lobsters | 366, 800 | 75, 693 | 268, 800 | 56, 078 |  |  | 4, 300 | 1, 290 | 639, 900 | 133, 061 |
| Shrimp | 78, 800 | 6, 996 | 37, 100 | 9, 275 |  |  |  |  | 115, 900 | 16, 271 |
| Clams: |  |  |  |  |  |  |  |  |  |  |
| Hard, public [1] | 2, 147, 900 | 374, 543 | 2, 211, 500 | 383, 275 |  |  | 7, 600 | 920 | 4, 367, 000 | 758, 738 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hard, private [1] | 383,500 | 67,914 | 311,700 | 47,497 | | | 16,000 | 2,330 | 711,200 | 117,741 |
| Soft, public [2] | 770,000 | 85,445 | 1,177,700 | 68,646 | | | | | 1,947,700 | 154,091 |
| Soft, private [2] | 12,800 | 1,536 | | | | | | | 12,800 | 1,536 |
| Surf or skimmer | 971,800 | 60,114 | 613,900 | 18,984 | | | | | 1,585,700 | 79,098 |
| Conchs | 12,600 | 1,236 | | | | | | | 12,600 | 1,236 |
| Mussels, sea | 90,700 | 5,262 | | | | | 2,800 | 173 | 93,500 | 5,435 |
| Oysters, market: [3] | | | | | | | | | | |
| Public, spring | 499,700 | 83,950 | 53,000 | 11,435 | | | | | 552,700 | 95,385 |
| Public, fall | 200,200 | 32,432 | 143,300 | 13,339 | | | | | 343,500 | 45,771 |
| Private, spring | 4,227,700 | 748,303 | 1,935,400 | 262,928 | | | | | 6,163,100 | 1,011,231 |
| Private, fall | 4,856,900 | 845,101 | 2,431,000 | 343,890 | | | 270,200 | 29,170 | 7,558,100 | 1,218,161 |
| Scallops: | | | | | | | | | | |
| Bay | 36,000 | 8,650 | | | | | | | 36,000 | 8,650 |
| Sea | 2,818,700 | 329,255 | 234,100 | 13,659 | | | | | 3,052,800 | 342,914 |
| Squid | 1,207,200 | 44,471 | 1,145,700 | 22,386 | | | | | 2,352,900 | 66,857 |
| Terrapin, diamond-back | | | 700 | 261 | | | | | 700 | 261 |
| Turtles: | | | | | | | | | | |
| Hawksbill | | | 3,900 | 78 | | | | | 3,900 | 78 |
| Loggerhead | | | 6,700 | 122 | | | | | 6,700 | 122 |
| Snapper | | | 8,200 | 511 | | | 3,100 | 246 | 11,300 | 757 |
| Bloodworms | 34,700 | 27,040 | | | | | | | 34,700 | 27,040 |
| Sandworms | 38,500 | 27,772 | | | | | | | 38,500 | 27,772 |
| Total | 19,278,100 | 2,839,563 | 14,044,400 | 1,301,570 | | | 1,135,900 | 54,585 | 34,458,400 | 4,195,718 |
| Grand total | 84,160,500 | 4,371,046 | 129,516,200 | 3,200,958 | 34,700 | 4,632 | 50,940,500 | 319,354 | 264,651,900 | 7,895,990 |

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[1] Statistics on hard clams are based on yields of 8 pounds of meat to the bushel in New York, 8.07 pounds in New Jersey, and 10 pounds in Delaware.

[2] Statistics on soft clams are based on yields of 16 pounds of meat to the bushel in New York, and 20 pounds in New Jersey.

[3] Statistics on oysters are based on yields of 7 pounds of meat to the bushel in New York, 6.05 pounds in New Jersey, and 7 pounds in Delaware.

NOTE.—The above includes the catch made by Middle Atlantic craft in the southern trawl fishery as well as in other fisheries in the South Atlantic.

*Fisheries of the Middle Atlantic States, 1937*—Continued

SUPPLEMENTARY TABLE SHOWING THE PRODUCTION OF CERTAIN SHELLFISH IN NUMBER AND BUSHELS

| Product | New York | | New Jersey | | Delaware | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Crabs: | | | | | | | | |
| Hard ........ number | 1,533,300 | $11,350 | 1,906,800 | $21,904 | 793,200 | $4,708 | 4,233,300 | $37,962 |
| King ........ do | | | 691,625 | 7,221 | 122,250 | 854 | 813,875 | 8,075 |
| Soft and peelers ........ do | 50,000 | 2,500 | 238,400 | 20,081 | 314,000 | 14,894 | 602,400 | 37,475 |
| Clams: | | | | | | | | |
| Hard, public ........ bushels | 268,488 | 374,543 | 274,040 | 383,275 | 760 | 920 | 543,288 | 758,738 |
| Hard, private ........ do | 47,938 | 67,914 | 38,624 | 47,497 | 1,600 | 2,330 | 88,162 | 117,741 |
| Soft, public ........ do | 48,125 | 85,445 | 58,885 | 68,646 | | | 107,010 | 154,091 |
| Soft, private ........ do | 800 | 1,536 | | | | | 800 | 1,536 |
| Surf or skimmer ........ do | 80,983 | 60,114 | 34,489 | 18,984 | | | 115,472 | 79,098 |
| Conchs ........ do | 700 | 1,236 | | | | | 700 | 1,236 |
| Mussels, sea ........ do | 9,070 | 5,262 | | | 233 | 173 | 9,303 | 5,435 |
| Oysters, market: | | | | | | | | |
| Public, spring ........ do | 71,386 | 83,950 | 8,760 | 11,435 | | | 80,146 | 95,385 |
| Public, fall ........ do | 28,600 | 32,432 | 23,686 | 13,339 | | | 52,286 | 45,771 |
| Private, spring ........ do | 603,957 | 748,303 | 319,901 | 262,928 | | | 923,858 | 1,011,231 |
| Private, fall ........ do | 693,843 | 845,101 | 401,818 | 343,890 | 38,600 | 29,170 | 1,134,261 | 1,218,161 |
| Scallops: | | | | | | | | |
| Bay ........ do | 7,200 | 8,650 | | | | | 7,200 | 8,650 |
| Sea ........ do | 469,783 | 329,255 | 39,017 | 13,659 | | | 508,800 | 342,914 |

SEED OYSTER FISHERY

| Item | New York | New Jersey | Delaware | Total |
|---|---|---|---|---|
| OPERATING UNITS | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* |
| On vessels | 28 | 1,158 | 40 | 1,226 |
| On boats and shore: | | | | |
| Regular | 109 | 83 | | 192 |
| Casual | 39 | 120 | | 159 |
| Total | 176 | 1,361 | 40 | 1,577 |
| Vessels: | | | | |
| Motor | 5 | 2 | | 7 |
| Net tonnage | 149 | 23 | | 172 |
| Sail | | 103 | 5 | 108 |
| Net tonnage | | 2,371 | 89 | 2,460 |
| Total vessels | 5 | 105 | 5 | 115 |
| Total net tonnage | 149 | 2,394 | 89 | 2,632 |
| Boats: | | | | |
| Motor | 20 | 75 | | 95 |
| Other | 128 | 121 | | 249 |
| Apparatus: | | | | |
| Dredges | 10 | 210 | 10 | 230 |
| Yards at mouth | 19 | 260 | 12 | 291 |
| Tongs | 148 | 198 | | 346 |
| Rakes | | 5 | | 5 |

| Item | New York | | New Jersey | | Delaware | | Total | |
|---|---|---|---|---|---|---|---|---|
| CATCH | | | | | | | | |
| Oysters, seed: | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* |
| Public, spring | 39,829 | $34,995 | 1,061,010 | $403,870 | 83,600 | $13,800 | 1,184,439 | $452,665 |
| Public, fall | 12,783 | 13,760 | 11,540 | 2,980 | | | 24,323 | 16,740 |
| Private, spring | 5,766 | 4,996 | | | | | 5,766 | 4,996 |
| Private, fall | 32,161 | 33,290 | | | | | 32,161 | 33,290 |
| Total | 90,539 | 87,041 | 1,072,550 | 406,850 | 83,600 | 13,800 | 1,246,689 | 507,691 |

NOTE.—Of the total number of persons fishing for seed oysters, 1,517 are duplicated among those fishing for market oysters or other species. Similarly, the following craft and gear are duplicated: 60 vessels, 92 motor boats, 248 other boats, 122 dredges, 341 tongs, and 4 rakes.

## *Industries related to the fisheries of the Middle Atlantic States, 1937*

### OPERATING UNITS, SALARIES, AND WAGES

| Item | New York | New Jersey | Pennsylvania | Delaware | Total |
|---|---|---|---|---|---|
| Transporting: | | | | | |
| Persons engaged: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 40 | 17 | --------- | --------- | 57 |
| On boats | --------- | 69 | --------- | --------- | 69 |
| Total | 40 | 86 | --------- | --------- | 126 |
| Vessels, motor | 13 | 7 | --------- | --------- | 20 |
| Net tonnage | 298 | 134 | --------- | --------- | 432 |
| Boats | --------- | 68 | --------- | --------- | 68 |
| Wholesale and manufacturing: | | | | | |
| Establishments | 235 | 126 | 42 | 16 | 419 |
| Persons engaged: | | | | | |
| Proprietors | 50 | 106 | 37 | 18 | 211 |
| Salaried employees | 762 | 156 | 82 | 20 | 1, 020 |
| Wage earners: | | | | | |
| Average for season | 3, 363 | 1, 529 | 346 | 370 | 5, 608 |
| Average for year | 2, 820 | 967 | 270 | 172 | 4, 229 |
| Paid to salaried employees | $2, 415, 285 | $347, 792 | $142, 174 | $25, 409 | $2, 930, 660 |
| Paid to wage earners | $4, 269, 005 | $917, 604 | $338, 864 | $155, 560 | $5, 681, 033 |
| Total salaries and wages | $6, 684, 290 | $1, 265, 396 | $481, 038 | $180, 969 | $8, 611, 693 |
| Fishermen, manufacturing | 236 | 49 | --------- | --------- | 285 |

### PRODUCTS MANUFACTURED

| Item | New York | | New Jersey | | Pennsylvania | | Delaware | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments: | | | | | | | | |
| Buffalofish, smoked pounds | 893, 800 | $235, 133 | --------- | --------- | --------- | --------- | --------- | --------- |
| Butterfish, smoked do | 612, 900 | 157, 382 | 74, 365 | $22, 626 | (1) | (1) | --------- | --------- |
| Carp, smoked do | --------- | --------- | 67, 700 | 25, 776 | --------- | --------- | --------- | --------- |
| Cisco, chubs, and tullibees, smoked pounds | 3, 465, 500 | 1, 020, 600 | 229, 000 | 87, 080 | (1) | (1) | --------- | --------- |
| Cod, fresh fillets do | 3, 747, 500 | 473, 675 | 493, 500 | 58, 009 | --------- | --------- | --------- | --------- |
| Flounders, fresh fillets pounds | 1, 471, 000 | 258, 655 | 205, 500 | 31, 500 | --------- | --------- | --------- | --------- |
| Haddock, fresh fillets pounds | 1, 664, 000 | 206, 515 | 1, 518, 700 | 175, 377 | --------- | --------- | --------- | --------- |
| Hake, fresh fillets do | 94, 000 | 10, 700 | --------- | --------- | --------- | --------- | --------- | --------- |
| Herring, sea, kippered pounds | 163, 800 | 21, 426 | --------- | --------- | (1) | (1) | --------- | --------- |
| Herring, sea, bloaters, smoked pounds | --------- | --------- | 55, 300 | 7, 810 | (1) | (1) | --------- | --------- |
| Lake trout, smoked pounds | 189, 500 | 89, 702 | (1) | (1) | (1) | (1) | --------- | --------- |
| Mackerel, smoked do | 766, 300 | 110, 732 | (1) | (1) | (1) | (1) | --------- | --------- |
| Pollock, fresh fillets pounds | 27, 000 | 3, 100 | --------- | --------- | --------- | --------- | --------- | --------- |
| Paddlefish or spoonbill cat, smoked pounds | 308, 600 | 127, 150 | --------- | --------- | --------- | --------- | --------- | --------- |
| Salmon: | | | | | | | | |
| Smoked do | 6, 706, 900 | 1, 952, 117 | 418, 975 | 145, 981 | (1) | (1) | --------- | --------- |
| Kippered do | 146, 600 | 43, 890 | 95, 600 | 35, 000 | (1) | (1) | --------- | --------- |
| Roe, canned standard cases | 1, 534 | 36, 001 | --------- | --------- | --------- | --------- | --------- | --------- |
| Shad, smoked pounds | 79, 500 | 15, 593 | (1) | (1) | (1) | (1) | --------- | --------- |
| Sturgeon: | | | | | | | | |
| Smoked do | 1, 162, 700 | 787, 194 | 210, 949 | 155, 496 | (1) | (1) | --------- | --------- |
| Caviar, canned standard cases | 3, 053 | 435, 370 | --------- | --------- | --------- | --------- | --------- | --------- |
| Whale products: | | | | | | | | |
| Sperm oil gallons | 5, 837 | 1, 500 | --------- | --------- | --------- | --------- | --------- | --------- |
| Whale oil do | 8, 270, 752 | 3, 693, 169 | --------- | --------- | --------- | --------- | --------- | --------- |
| Whitefish: | | | | | | | | |
| Smoked pounds | 1, 636, 000 | 456, 483 | 155, 000 | 52, 085 | (1) | (1) | --------- | --------- |
| Caviar, canned standard cases | 502 | 14, 785 | --------- | --------- | --------- | --------- | --------- | --------- |

See footnotes at end of table.

*Industries related to the fisheries of the Middle Atlantic States, 1937*—Continued

PRODUCTS MANUFACTURED—Continued

| Item | New York | | New Jersey | | Pennsylvania | | Delaware | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments—Continued. | | | | | | | | |
| Crab, king, scrap and meal...tons | ------ | ------ | 300 | $12,124 | ------ | ------ | (1) | (1) |
| Clams: | | | | | | | | |
| Hard, fresh-shucked...gallons | ------ | ------ | (1) | (1) | 4,510 | $10,557 | ------ | ------ |
| Soft, fresh-shucked...gallons | ------ | ------ | 5,820 | 5,820 | ------ | ------ | ------ | ------ |
| Clam chowder, canned...standard cases | (1) | (1) | 177,071 | 636,607 | ------ | ------ | ------ | ------ |
| Marine-shell products: | | | | | | | | |
| Buttons...gross | 1,138,334 | $813,556 | 1,646,622 | 1,254,165 | (1) | (1) | ------ | ------ |
| Novelties | ------ | 113,500 | ------ | 91,922 | ------ | ------ | ------ | ------ |
| Oysters, fresh-shucked...gallons | 387,481 | 765,213 | 382,471 | 675,659 | 60,080 | 116,785 | (1) | (1) |
| Oyster-shell products: | | | | | | | | |
| Poultry feed...tons | (1) | (1) | 4,441 | 35,174 | 4,294 | 38,969 | (1) | (1) |
| Lime...do | (1) | (1) | 1,763 | 8,359 | 1,109 | 4,533 | (1) | (1) |
| Unclassified products: | | | | | | | | |
| Smoked...pounds | (2) | (2) | [3] 130,370 | [3] 26,607 | [4] 2,031,900 | [4] 528,651 | ------ | ------ |
| Canned...standard cases | [5] 17,815 | [5] 216,553 | (2) | (2) | ------ | ------ | ------ | ------ |
| Miscellaneous | ------ | [6] 826,079 | ------ | [7] 771,516 | ------ | [8] 172,996 | ------ | [9] $585,648 |
| Total | ------ | 12,885,773 | ------ | 4,314,693 | ------ | 872,491 | ------ | 585,648 |
| By fishermen: | | | | | | | | |
| Bluefish, smoked...pounds | ------ | ------ | 2,500 | 500 | ------ | ------ | ------ | ------ |
| Butterfish, smoked...do | ------ | ------ | 3,000 | 600 | ------ | ------ | ------ | ------ |
| Cod, smoked...do | ------ | ------ | 1,500 | 300 | ------ | ------ | ------ | ------ |
| Eels, smoked...do | 38,400 | 9,724 | 10,000 | 3,300 | ------ | ------ | ------ | ------ |
| Mackerel, smoked...do | ------ | ------ | 2,000 | 400 | ------ | ------ | ------ | ------ |
| Whiting, smoked...do | ------ | ------ | 9,500 | 1,675 | ------ | ------ | ------ | ------ |
| Scallops: | | | | | | | | |
| Bay, fresh-shucked...gallons | 3,958 | 6,041 | ------ | ------ | ------ | ------ | ------ | ------ |
| Sea, fresh-shucked...gallons | 148,018 | 159,944 | 26,000 | 22,500 | ------ | ------ | ------ | ------ |
| Crab, king, scrap and meal...tons | ------ | ------ | 127 | 3,432 | ------ | ------ | ------ | ------ |
| Sturgeon, roe, salted...pounds | ------ | ------ | 150 | 225 | ------ | ------ | ------ | ------ |
| Total | ------ | 175,709 | ------ | 32,932 | ------ | ------ | ------ | ------ |
| Grand total | ------ | 13,061,482 | ------ | 4,347,625 | ------ | 872,491 | ------ | 585,648 |

[1] The production of this item is included under "Unclassified products."

[2] This item has been included under "Miscellaneous."

[3] Includes smoked eels, haddock, finnan haddie, hake, lake trout, mackerel, scup, shad, and whiting.

[4] Includes smoked butterfish, chubs, cisco, haddock and haddock fillets, sea herring (kippers and bloaters), lake trout, mackerel, shad, salmon, sturgeon, tullibees, and whitefish, and kippered salmon.

[5] Includes canned pickled eels, pickled sea mussels, fish paste, clam products, and turtle and terrapin products.

[6] Includes fresh fillets of halibut and mackerel, smoked eels, halibut, swordfish, and tuna-liver oils, menhaden products, oyster- and mussel-shell products, and miscellaneous fish meals.

[7] Includes fresh-shucked hard clams, canned clam products and fish chowder, cod, swordfish, and tuna-liver oils, salted boned cod, pickled eels, and herring roe; and menhaden and shark products.

[8] Includes miscellaneous fish scrap and marine-shell buttons.

[9] Includes salted sturgeon roe, fresh-shucked oysters, oyster-shell products, king-crab scrap, and menhaden products.

NOTE.—The total value of the manufactured products for the Middle Atlantic States was as follows: By manufacturing establishments, $18,658,605; and by fishermen, $208,641. Some of the above products may have been manufactured from fishery products imported from another State or a foreign country; therefore they cannot be correlated directly with the catch within the State. Of the total number of persons engaged on transporting craft, 122 have been included as fishermen, and among the total number of persons engaged in the preparation of fishermen's prepared products, 285 have been included as fishermen. The whale products shown above were manufactured on floating factory ships operating in the Southern Hemisphere. For additional data on the whale fishery, the reader is referred to the section in the latter part of this document entitled "Whaling."

## NEW YORK

### *Fisheries of New York, 1937*

OPERATING UNITS: BY GEAR

| Item | Purse seines | | | Haul seines | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | Mackerel | Menhaden | Other | | Anchor | Drift | Run-around | Stake |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 32 | 207 | 12 | 7 | 4 | 4 | 14 | 2 |
| On boats and shore: | | | | | | | | |
| Regular | --- | --- | --- | 59 | --- | 68 | --- | 117 |
| Casual | --- | --- | --- | 140 | --- | 302 | --- | 91 |
| Total | 32 | 207 | 12 | 206 | 4 | 274 | 14 | 210 |
| Vessels: | | | | | | | | |
| Steam, 41 to 50 tons | --- | 1 | --- | --- | --- | --- | --- | --- |
| Net tonnage | --- | 45 | --- | --- | --- | --- | --- | --- |
| Motor: | | | | | | | | |
| 5 to 10 tons | 1 | --- | --- | 1 | 1 | 1 | 2 | --- |
| 11 to 20 tons | --- | 3 | --- | 1 | --- | --- | 1 | 1 |
| 21 to 30 tons | 1 | --- | 1 | --- | --- | --- | --- | --- |
| 31 to 40 tons | --- | 1 | --- | --- | --- | --- | --- | --- |
| 41 to 50 tons | 1 | --- | --- | --- | --- | --- | --- | --- |
| 101 to 110 tons | --- | 2 | --- | --- | --- | --- | --- | --- |
| 111 to 120 tons | --- | 1 | --- | --- | --- | --- | --- | --- |
| 161 to 170 tons | --- | 1 | --- | --- | --- | --- | --- | --- |
| Total | 3 | 8 | 1 | 2 | 1 | 1 | 3 | 1 |
| Net tonnage | 72 | 567 | 29 | 22 | 10 | 10 | 37 | 11 |
| Total vessels | 3 | 9 | 1 | 2 | 1 | 1 | 3 | 1 |
| Total net tonnage | 72 | 612 | 29 | 22 | 10 | 10 | 37 | 11 |
| Boats: | | | | | | | | |
| Motor | --- | --- | --- | 7 | --- | 2 | --- | 30 |
| Other | --- | --- | --- | 67 | --- | 198 | --- | 87 |
| Accessory boats | 7 | 27 | 2 | 2 | 2 | 2 | 7 | 2 |
| Apparatus: | | | | | | | | |
| Number | 3 | 9 | 1 | 71 | 11 | 189 | 4 | 354 |
| Length, yards | 1,330 | 3,530 | 400 | 13,625 | --- | --- | --- | --- |
| Square yards | --- | --- | --- | --- | 666 | 596,986 | 9,840 | 88,936 |

| Item | Lines | | | | Pound nets | Fyke nets | Dip nets | Otter trawls | |
|---|---|---|---|---|---|---|---|---|---|
| | Hand | Trawl | Trot with baits or snoods | Trot with hooks | | | | Fish | Shrimp |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 64 | 185 | --- | --- | 52 | 6 | --- | 227 | 2 |
| On boats and shore: | | | | | | | | | |
| Regular | 62 | 94 | 76 | 6 | 15 | 35 | --- | 114 | --- |
| Casual | --- | --- | 50 | 21 | 2 | 116 | 36 | --- | --- |
| Total | 126 | 279 | 126 | 27 | 69 | 157 | 36 | 341 | 2 |
| Vessels, motor: | | | | | | | | | |
| 5 to 10 tons | 11 | 9 | --- | --- | 7 | 1 | --- | 43 | 1 |
| 11 to 20 tons | 7 | 4 | --- | --- | 4 | 1 | --- | 35 | --- |
| 21 to 30 tons | 1 | 1 | --- | --- | 2 | --- | --- | 8 | --- |
| 31 to 40 tons | --- | --- | --- | --- | --- | --- | --- | 5 | --- |
| 41 to 50 tons | --- | 3 | --- | --- | --- | --- | --- | --- | --- |
| 51 to 60 tons | --- | 3 | --- | --- | --- | --- | --- | 2 | --- |
| 61 to 70 tons | --- | 2 | --- | --- | --- | --- | --- | --- | --- |
| Total | 19 | 22 | --- | --- | 13 | 2 | --- | 93 | 1 |
| Net tonnage | 209 | 571 | --- | --- | 152 | 22 | --- | 1,296 | 6 |
| Boats: | | | | | | | | | |
| Motor | 29 | 45 | 24 | --- | 3 | 2 | --- | 57 | --- |
| Other | 6 | --- | 12 | 16 | 10 | 82 | 18 | --- | --- |
| Accessory boats | --- | 53 | --- | --- | 16 | --- | --- | --- | --- |
| Apparatus: | | | | | | | | | |
| Number | 105 | 3,894 | 72 | 14 | 136 | 573 | 36 | 152 | 1 |
| Yards at mouth | --- | --- | --- | --- | --- | --- | --- | 3,108 | 23 |
| Hooks, baits, or snoods | 105 | 248,660 | 44,000 | 2,385 | --- | --- | --- | --- | --- |

*Fisheries of New York, 1937*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Eel traps | Pots | | | Harpoons | Spears | Dredges | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Eel | Fish | Lobster | | | Clam | Crab | Mussel |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 4 | 5 | | 6 | 35 | | 14 | 5 | 3 |
| On boats and shore: | | | | | | | | | |
| Regular | 20 | 46 | 21 | 86 | | 22 | 26 | 2 | |
| Casual | | 62 | | 44 | | 34 | | | |
| Total | 24 | 113 | 21 | 136 | 35 | 56 | 40 | 7 | 3 |
| Vessels, motor: | | | | | | | | | |
| 5 to 10 tons | 2 | 1 | | 4 | 4 | | 4 | 1 | |
| 11 to 20 tons | | 1 | | | 4 | | 3 | 1 | 1 |
| 21 to 30 tons | | | | | 2 | | | | |
| 41 to 50 tons | | | | | 2 | | | | |
| 51 to 60 tons | | | | | 1 | | | | |
| Total | 2 | 2 | | 4 | 13 | | 7 | 2 | 1 |
| Net tonnage | 19 | 22 | | 29 | 291 | | 73 | 23 | 13 |
| Boats: | | | | | | | | | |
| Motor | | | 21 | 81 | | 12 | 13 | 1 | |
| Other | 9 | 64 | | 33 | | 22 | | | |
| Accessory boats | | | | | 13 | | | | |
| Apparatus: | | | | | | | | | |
| Number | 60 | 1, 488 | 1, 110 | 13, 850 | 13 | 56 | 42 | 7 | 2 |
| Yards at mouth | | | | | | | 42 | 12 | 2 |

| Item | Dredges—Continued | | | Tongs | | Rakes, other than for oysters | Forks | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| | Oyster | | Scallop | Oyster | Other | | | |
| | Common | Suction | | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 198 | 4 | 207 | 36 | 100 | | | 1, 158 |
| On boats and shore: | | | | | | | | |
| Regular | 12 | | | 213 | 758 | 110 | 128 | 1, 104 |
| Casual | | | | 64 | 430 | 67 | 274 | 1, 027 |
| Total | 210 | 4 | 207 | 313 | 1, 288 | 177 | 402 | 3, 289 |
| Vessels: | | | | | | | | |
| Steam, 41 to 50 tons | | | | | | | | 1 |
| Net tonnage | | | | | | | | 45 |
| Motor: | | | | | | | | |
| 5 to 10 tons | 12 | | 8 | 17 | 47 | | | 116 |
| 11 to 20 tons | 23 | 1 | 17 | 1 | 2 | | | 79 |
| 21 to 30 tons | 9 | | 7 | | | | | 24 |
| 31 to 40 tons | 3 | | 3 | | | | | 10 |
| 41 to 50 tons | 1 | | | | | | | 4 |
| 51 to 60 tons | | | 1 | | | | | 5 |
| 61 to 70 tons | | | | | | | | 2 |
| 101 to 110 tons | | | | | | | | 2 |
| 111 to 120 tons | | | | | | | | 1 |
| 161 to 170 tons | | | | | | | | 1 |
| Total | 48 | 1 | 36 | 18 | 49 | | | 244 |
| Net tonnage | 805 | 20 | 653 | 120 | 326 | | | 3, 989 |
| Total vessels | 48 | 1 | 36 | 18 | 49 | | | 245 |
| Total net tonnage | 805 | 20 | 653 | 120 | 326 | | | 4, 034 |
| Boats: | | | | | | | | |
| Motor | 4 | | | 101 | 345 | 25 | 76 | 511 |
| Other | | | | 76 | 422 | 152 | 131 | 808 |
| Accessory boats | | | | | | | | 125 |
| Apparatus: | | | | | | | | |
| Number | 104 | 1 | 72 | 313 | 1, 287 | 177 | 402 | |
| Yards at mouth | 145 | 2 | 244 | | | | | |

## *Fisheries of New York, 1937*—Continued

### CATCH: By gear

| Species | Purse seines |  |  |  |  |  | Haul seines |  |
|---|---|---|---|---|---|---|---|---|
|  | Mackerel |  | Menhaden |  | Other |  |  |  |
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives |  |  |  |  |  |  | 135,600 | $2,347 |
| Bluefish |  |  |  |  |  |  | 2,000 | 148 |
| Butterfish |  |  |  |  |  |  | 300 | 25 |
| Carp |  |  |  |  |  |  | 83,000 | 5,603 |
| Catfish and bullheads |  |  |  |  |  |  | 4,000 | 347 |
| Croaker |  |  |  |  | 1,900 | $19 |  |  |
| Flounders, blackback |  |  |  |  |  |  | 100 | 6 |
| King whiting or "kingfish" |  |  |  |  |  |  | 17,900 | 204 |
| Mackerel | 153,100 | $6,704 |  |  |  |  |  |  |
| Menhaden |  |  | 31,500,000 | $163,121 |  |  |  |  |
| Mummichog |  |  |  |  |  |  | 1,300 | 140 |
| Scup or porgy |  |  |  |  | 110,000 | 2,200 | 39,800 | 2,694 |
| Sea bass |  |  |  |  | 1,200 | 96 | 200 | 15 |
| Shad |  |  |  |  |  |  | 19,700 | 1,433 |
| Smelt |  |  |  |  |  |  | 600 | 76 |
| Spot |  |  |  |  |  |  | 200 | 3 |
| Squeteagues or "sea trout," gray |  |  |  |  | 300,000 | 9,000 | 316,900 | 16,095 |
| Striped bass |  |  |  |  |  |  | 82,500 | 7,064 |
| Suckers |  |  |  |  |  |  | 3,800 | 254 |
| Tautog |  |  |  |  | 1,200 | 12 | 100 | 2 |
| Thimble-eyed mackerel |  |  |  |  | 1,900 | 57 |  |  |
| Tomcod |  |  |  |  |  |  | 100 | 10 |
| Yellow perch |  |  |  |  |  |  | 4,400 | 236 |
| Shrimp |  |  |  |  |  |  | 20,600 | 5,150 |
| Total | 153,100 | 6,704 | 31,500,000 | 163,121 | 416,200 | 11,384 | 733,100 | 41,852 |

| Species | Gill nets |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  | Anchor |  | Drift |  | Runaround |  | Stake |  |
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives |  |  | 9,900 | $289 |  |  | 1,000 | $22 |
| Bluefish | 3,000 | $300 | 23,300 | 2,479 | 5,600 | $448 | 14,200 | 1,240 |
| Butterfish |  |  |  |  |  |  | 8,400 | 840 |
| Carp |  |  | 1,400 | 85 |  |  | 41,600 | 3,071 |
| Catfish and bullheads |  |  | 300 | 16 |  |  | 400 | 20 |
| King whiting or "kingfish" |  |  |  |  |  |  | 800 | 19 |
| Mackerel |  |  | 6,100 | 122 | 96,000 | 2,880 |  |  |
| Shad |  |  | 932,600 | 70,009 |  |  | 30,400 | 2,556 |
| Squeteagues or "sea trout," gray | 5,700 | 342 | 6,000 | 240 | 4,000 | 320 | 18,000 | 850 |
| Striped bass | 2,500 | 375 | 6,700 | 813 |  |  | 15,400 | 1,545 |
| Sturgeon |  |  | 200 | 44 |  |  | 900 | 219 |
| Suckers |  |  |  |  |  |  | 900 | 60 |
| Yellow perch |  |  | 5,700 | 358 |  |  | 9,900 | 596 |
| Total | 11,200 | 1,017 | 992,200 | 74,455 | 105,600 | 3,648 | 141,900 | 11,038 |

*Fisheries of New York, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Lines | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Hand | | Trawl | | Trot with baits or snoods | | Trot with hooks | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 433,700 | $35,682 | 119,900 | $9,113 | | | | |
| Catfish and bullheads | | | | | | | 1,800 | $185 |
| Cod | 270,800 | 12,085 | 1,837,000 | 66,219 | | | | |
| Cusk | | | 90,900 | 1,283 | | | | |
| Eels, common | | | | | | | 1,700 | 116 |
| Flounders: | | | | | | | | |
| Blackback | 80,000 | 2,400 | 18,000 | 720 | | | | |
| Yellowtail and dab | 4,000 | 80 | | | | | | |
| Fluke | | | 4,000 | 440 | | | | |
| Unclassified | | | 15,000 | 756 | | | | |
| Haddock | 9,000 | 270 | 122,400 | 3,408 | | | | |
| Hake | | | 278,300 | 2,922 | | | | |
| Halibut | | | 2,000 | 223 | | | | |
| Mackerel | 105,300 | 2,283 | 16,000 | 387 | | | | |
| Pollock | 83,600 | 2,273 | 16,200 | 312 | | | | |
| Scup or porgy | 7,700 | 221 | 3,200 | 84 | | | | |
| Sea bass | 92,000 | 7,361 | 1,300 | 99 | | | | |
| Squeteagues or "sea trout," gray | 25,700 | 1,284 | 300 | 13 | | | | |
| Striped bass | 1,900 | 176 | | | | | | |
| Swordfish | | | 200 | 42 | | | | |
| Tilefish | 42,600 | 2,192 | 2,312,000 | 97,922 | | | | |
| Wolffish | | | 5,800 | 139 | | | | |
| Crabs, hard | 2,600 | 175 | | | 478,200 | $10,321 | | |
| Total | 1,158,900 | 66,482 | 4,842,500 | 184,082 | 478,200 | 10,321 | 3,500 | 301 |

| Species | Pound nets | | Fyke nets | | Dip nets | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 10,300 | $88 | 61,100 | $1,093 | | |
| Bluefish | 216,300 | 15,691 | | | | |
| Bonito | 50,400 | 2,061 | | | | |
| Butterfish | 1,498,100 | 91,771 | | | | |
| Carp | | | 9,700 | 707 | | |
| Catfish and bullheads | | | 17,600 | 1,911 | | |
| Cod | 18,900 | 885 | | | | |
| Eels: | | | | | | |
| Common | 14,100 | 723 | 1,200 | 95 | | |
| Conger | 200 | 8 | | | | |
| Flounders: | | | | | | |
| Blackback | 2,600 | 133 | 35,200 | 2,037 | | |
| Fluke | 79,800 | 4,668 | | | | |
| Frigate mackerel | 26,500 | 265 | | | | |
| Grayfish | 100 | 2 | | | | |
| Herring, sea | 4,600 | 46 | | | | |
| King whiting or "kingfish" | 16,100 | 258 | | | | |
| Mackerel | 1,055,600 | 22,205 | | | | |
| Menhaden | 392,000 | 1,310 | | | | |
| Pollock | 700 | 22 | | | | |
| Scup or porgy | 567,900 | 16,986 | | | | |
| Sea bass | 53,600 | 4,341 | | | | |
| Sea robin | 8,500 | 174 | | | | |
| Shad | 38,700 | 2,865 | | | | |
| Sharks | 17,100 | 1,083 | | | | |
| Skates | 38,400 | 210 | | | | |
| Spanish mackerel | 100 | 2 | | | | |
| Spot | 100 | 2 | | | | |
| Squeteagues or "sea trout," gray | 625,200 | 24,671 | 20,000 | 987 | | |
| Squirrel hake | 100 | 2 | | | | |
| Striped bass | 21,500 | 1,606 | 100 | 12 | | |
| Sturgeon | 100 | 12 | | | | |
| Suckers | | | 25,200 | 1,672 | | |
| Sunfish | | | 1,600 | 93 | | |
| Swellfish | 56,100 | 579 | | | | |
| Tautog | 4,000 | 48 | 600 | 18 | | |
| Thimble-eyed mackerel | 46,000 | 1,420 | | | | |
| Tomcod | | | 3,000 | 110 | | |
| Tuna | 43,400 | 2,218 | | | | |
| Whiting | 304,900 | 5,294 | | | | |
| Yellow perch | | | 9,500 | 861 | | |
| Crabs: | | | | | | |
| Hard | | | | | 4,400 | $165 |
| Soft and peelers | | | | | 12,500 | 2,500 |
| Squid | 608,200 | 23,999 | | | | |
| Total | 5,820,200 | 225,648 | 184,800 | 9,596 | 16,900 | 2,665 |

*Fisheries of New York, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Otter trawls | | | | Eel traps | | Eel pots | |
|---|---|---|---|---|---|---|---|---|
| | Fish | | Shrimp | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 3,900 | $50 | | | | | | |
| Bluefish | 40,100 | 3,291 | | | | | | |
| Butterfish | 393,400 | 19,829 | | | | | | |
| Cod | 1,675,800 | 74,629 | | | | | | |
| Croaker | 28,000 | 296 | | | | | | |
| Drum, red or redfish | 100 | 1 | | | | | | |
| Eels: | | | | | | | | |
| Common | | | | | 13,400 | $730 | 111,700 | $6,866 |
| Conger | 800 | 14 | | | | | | |
| Flounders: | | | | | | | | |
| Gray sole | 89,100 | 6,261 | | | | | | |
| Lemon sole | 145,800 | 9,610 | | | | | | |
| Yellowtail and dab | 2,813,000 | 126,499 | | | | | | |
| Blackback | 2,600,900 | 140,580 | | | | | | |
| Fluke | 2,014,500 | 99,005 | | | | | | |
| Unclassified | 663,800 | 33,182 | 300 | $15 | | | | |
| Haddock | 2,150,500 | 72,079 | | | | | | |
| Hake | 38,900 | 1,185 | | | | | | |
| Halibut | 800 | 68 | | | | | | |
| King whiting or "kingfish" | 34,500 | 362 | 3,300 | 50 | | | | |
| Mackerel | 15,800 | 497 | | | | | | |
| Pollock | 15,600 | 411 | | | | | | |
| Rosefish | 1,500 | 15 | | | | | | |
| Scup or porgy | 978,500 | 28,264 | | | | | | |
| Sea bass | 192,200 | 15,430 | | | | | | |
| Sea robin | 7,500 | 151 | | | | | | |
| Sharks | 5,100 | 54 | | | | | | |
| Skates | 24,900 | 132 | | | | | | |
| Squeteagues or "sea trout," gray | 135,300 | 4,909 | | | | | | |
| Squirrel hake | 4,900 | 96 | | | | | | |
| Striped bass | 1,400 | 111 | | | | | | |
| Swordfish | 1,600 | 317 | | | | | | |
| Tilefish | 35,000 | 1,750 | | | | | | |
| Whiting | 4,884,300 | 81,823 | | | | | | |
| Lobsters | 1,300 | 217 | | | | | | |
| Shrimp | | | 58,200 | 1,846 | | | | |
| Conchs | 12,600 | 1,236 | | | | | | |
| Squid | 599,000 | 20,472 | | | | | | |
| Total | 19,610,400 | 743,126 | 61,800 | 1,911 | 13,400 | 730 | 111,700 | 6,866 |

| Species | Pots—Continued | | | | Harpoons | | Spears | |
|---|---|---|---|---|---|---|---|---|
| | Fish | | Lobster | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels, common | | | | | | | 30,300 | $1,545 |
| Sea bass | 186,900 | $11,215 | | | | | | |
| Swordfish | | | | | 107,200 | $19,857 | | |
| Lobsters | 18,000 | 3,600 | 347,500 | $71,876 | | | | |
| Total | 204,900 | 14,815 | 347,500 | 71,876 | 107,200 | 19,857 | 30,300 | 1,545 |

| Species | Dredges | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Clam | | Crab | | Mussel | | Oyster | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs, hard | | | 25,900 | $689 | | | | |
| Clams: | | | | | | | | |
| Hard, public | 17,600 | $2,000 | | | | | | |
| Surf | 971,800 | 60,114 | | | | | | |
| Mussels, sea | | | | | 8,700 | $348 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | | | | | | | 16,200 | $2,722 |
| Public, fall | | | | | | | 13,600 | 2,203 |
| Private, spring | | | | | | | 4,227,700 | 748,303 |
| Private, fall | | | | | | | 4,856,900 | 845,101 |
| Total | 989,400 | 62,114 | 25,900 | 689 | 8,700 | 348 | 9,114,400 | 1,598,329 |

## *Fisheries of New York, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Dredges—Con. |  | Tongs |  | Rakes |  | Forks |  |
|---|---|---|---|---|---|---|---|---|
|  | Scallop |  |  |  |  |  |  |  |
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams: |  |  |  |  |  |  |  |  |
| Hard, public |  |  | 2,130,300 | $372,543 |  |  |  |  |
| Hard, private |  |  | 383,500 | 67,914 |  |  |  |  |
| Soft, public |  |  | 4,900 | 437 | 765,100 | $85,008 |  |  |
| Soft, private |  |  |  |  | 12,800 | 1,536 |  |  |
| Mussels, sea |  |  | 82,000 | 4,914 |  |  |  |  |
| Oysters, market: |  |  |  |  |  |  |  |  |
| Public, spring |  |  | 483,500 | 81,228 |  |  |  |  |
| Public, fall |  |  | 186,600 | 30,229 |  |  |  |  |
| Scallops: |  |  |  |  |  |  |  |  |
| Bay | 4,200 | $1,022 | 31,800 | 7,628 |  |  |  |  |
| Sea | 2,818,700 | 329,255 |  |  |  |  |  |  |
| Bloodworms |  |  |  |  |  |  | 34,700 | $27,040 |
| Sandworms |  |  |  |  |  |  | 38,500 | 27,772 |
| Total | 2,822,900 | 330,277 | 3,302,600 | 564,893 | 777,900 | 86,544 | 73,200 | 54,812 |

OPERATING UNITS: BY COUNTIES

| Item | Albany | Columbia | Dutchess | Greene | Kings | Nassau | New York | Orange |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels |  |  |  |  | 185 | 67 | 322 |  |
| On boats and shore: |  |  |  |  |  |  |  |  |
| Regular |  |  | 8 | 2 | 113 | 172 |  | 2 |
| Casual | 2 | 31 | 88 | 34 | 32 | 45 |  | 44 |
| Total | 2 | 31 | 96 | 36 | 330 | 284 | 322 | 46 |
| Vessels, motor: |  |  |  |  |  |  |  |  |
| 5 to 10 tons |  |  |  |  | 24 | 6 | 7 |  |
| 11 to 20 tons |  |  |  |  | 17 | 8 | 16 |  |
| 21 to 30 tons |  |  |  |  | 5 | 2 | 7 |  |
| 31 to 40 tons |  |  |  |  | 1 | 1 | 5 |  |
| 41 to 50 tons |  |  |  |  |  |  | 3 |  |
| 51 to 60 tons |  |  |  |  | 1 |  | 4 |  |
| 61 to 70 tons |  |  |  |  |  |  | 2 |  |
| Total |  |  |  |  | 48 | 17 | 44 |  |
| Net tonnage |  |  |  |  | 632 | 267 | 1,140 |  |
| Boats: |  |  |  |  |  |  |  |  |
| Motor |  |  |  |  | 55 | 52 |  |  |
| Other | 2 | 16 | 44 | 16 | 33 | 124 |  | 19 |
| Accessory boats |  |  |  |  | 9 |  | 61 |  |
| Apparatus: |  |  |  |  |  |  |  |  |
| Purse seines: |  |  |  |  |  |  |  |  |
| Mackerel |  |  |  |  |  |  | 3 |  |
| Length, yards |  |  |  |  |  |  | 1,330 |  |
| Other |  |  |  |  | 1 |  |  |  |
| Length, yards |  |  |  |  | 400 |  |  |  |
| Haul seines |  | 3 | 7 | 5 | 2 |  |  | 6 |
| Length, yards |  | 197 | 775 | 1,133 | 23 |  |  | 655 |
| Gill nets: |  |  |  |  |  |  |  |  |
| Drift |  | 6 | 26 | 4 |  |  |  | 8 |
| Square yards |  | 17,222 | 92,639 | 13,333 |  |  |  | 34,167 |
| Runaround |  |  |  |  | 1 |  |  |  |
| Square yards |  |  |  |  | 8,000 |  |  |  |
| Stake |  | 2 | 6 | 7 | 2 | 16 |  |  |
| Square yards |  | 105 | 1,280 | 987 | 644 | 1,878 |  |  |
| Lines: |  |  |  |  |  |  |  |  |
| Hand |  |  |  |  | 54 | 6 | 14 |  |
| Hooks |  |  |  |  | 54 | 6 | 14 |  |
| Trawl |  |  |  |  | 520 | 180 | 2,904 |  |
| Hooks |  |  |  |  | 35,800 | 10,000 | 150,860 |  |
| Trot with hooks |  |  | 3 |  |  |  |  | 4 |
| Hooks |  |  | 750 |  |  |  |  | 675 |
| Pound nets |  |  |  |  |  | 5 |  |  |
| Fyke nets | 4 | 72 | 64 | 17 |  |  |  | 5 |
| Otter trawls: |  |  |  |  |  |  |  |  |
| Fish |  |  |  |  | 48 | 13 | 31 |  |
| Yards at mouth |  |  |  |  | 959 | 190 | 861 |  |
| Shrimp |  |  |  |  |  |  | 1 |  |
| Yards at mouth |  |  |  |  |  |  | 23 |  |

## *Fisheries of New York, 1937*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Albany | Columbia | Dutchess | Greene | Kings | Nassau | New York | Orange |
|---|---|---|---|---|---|---|---|---|
| Apparatus—Continued | | | | | | | | |
| Pots: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Eel | | 4 | 22 | | 275 | | | 5 |
| Fish | | | | | | 1,110 | | |
| Lobster | | | | | 5,114 | | | |
| Harpoons | | | | | 1 | | 7 | |
| Spears | | | | | 4 | | | |
| Dredges: | | | | | | | | |
| Clam | | | | | 32 | 10 | | |
| Yards at mouth | | | | | 32 | 10 | | |
| Crab | | | | | 7 | | | |
| Yards at mouth | | | | | 12 | | | |
| Mussel | | | | | | 2 | | |
| Yards at mouth | | | | | | 2 | | |
| Oyster: | | | | | | | | |
| Common | | | | | | 26 | 2 | |
| Yards at mouth | | | | | | 38 | 3 | |
| Suction | | | | | | 1 | | |
| Yards at mouth | | | | | | 2 | | |
| Scallop | | | | | 20 | 4 | 44 | |
| Yards at mouth | | | | | 67 | 13 | 150 | |
| Tongs: | | | | | | | | |
| Oyster | | | | | | 19 | | |
| Other | | | | | | 133 | | |
| Rakes, other than for oysters | | | | | | 70 | | |
| Forks | | | | | 22 | 28 | | |

| Item | Putnam | Queens | Rensselaer | Richmond | Rockland | Suffolk | Ulster | Westchester |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | 2 | | 9 | | 570 | | 3 |
| On boats and shore: | | | | | | | | |
| Regular | 2 | | | | 15 | 756 | 17 | 17 |
| Casual | 7 | | 9 | | 101 | 423 | 116 | 95 |
| Total | 9 | 2 | 9 | 9 | 116 | 1,749 | 133 | 115 |
| Vessels: | | | | | | | | |
| Steam, 41 to 50 tons | | | | | | 1 | | |
| Net tonnage | | | | | | 45 | | |
| Motor: | | | | | | | | |
| 5 to 10 tons | | | | 1 | | 77 | | 1 |
| 11 to 20 tons | | 1 | | 1 | | 36 | | |
| 21 to 30 tons | | | | | | 10 | | |
| 31 to 40 tons | | | | | | 3 | | |
| 41 to 50 tons | | | | | | 1 | | |
| 101 to 110 tons | | | | | | 2 | | |
| 111 to 120 tons | | | | | | 1 | | |
| 161 to 170 tons | | | | | | 1 | | |
| Total | | 1 | | 2 | | 131 | | 1 |
| Net tonnage | | 13 | | 26 | | 1,903 | | 8 |
| Total vessels | | 1 | | 2 | | 132 | | 1 |
| Total net tonnage | | 13 | | 26 | | 1,948 | | |
| Boats: | | | | | | | | |
| Motor | | | | | | 404 | | |
| Other | 4 | | 4 | | 72 | 338 | 73 | 63 |
| Accessory boats | | | | 1 | | 53 | | 1 |
| Apparatus: | | | | | | | | |
| Purse seines: | | | | | | | | |
| Menhaden | | | | | | 9 | | |
| Length, yards | | | | | | 3,530 | | |
| Haul seines | 1 | | 3 | | 7 | 29 | 4 | 4 |
| Length, yards | 233 | | 263 | | 1,167 | 8,012 | 500 | 667 |
| Gill nets: | | | | | | | | |
| Anchor | | | | | | 11 | | |
| Square yards | | | | | | 666 | | |
| Drift | 2 | | | | 32 | 4 | 61 | 46 |
| Square yards | 1,111 | | | | 98,750 | 1,487 | 179,944 | 158,333 |
| Runaround | | | | | | 3 | | |
| Square yards | | | | | | 1,840 | | |
| Stake | | | | | 26 | 280 | 5 | 10 |
| Square yards | | | | | 7,542 | 72,000 | 3,133 | 1,367 |

## *Fisheries of New York, 1937*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Putnam | Queens | Rensselaer | Richmond | Rockland | Suffolk | Ulster | Westchester |
|---|---|---|---|---|---|---|---|---|
| Apparatus—Continued. | | | | | | | | |
| Lines: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Hand | -------- | -------- | -------- | 3 | -------- | 28 | -------- | -------- |
| Hooks | -------- | -------- | -------- | 3 | -------- | 28 | -------- | -------- |
| Trawl | -------- | -------- | -------- | -------- | -------- | 290 | -------- | -------- |
| Hooks | -------- | -------- | -------- | -------- | -------- | 52,000 | -------- | -------- |
| Trot with baits or snoods | -------- | -------- | -------- | -------- | -------- | 72 | -------- | -------- |
| Baits or snoods | -------- | -------- | -------- | -------- | -------- | 44,000 | -------- | -------- |
| Trot with hooks | -------- | -------- | -------- | -------- | 5 | -------- | 2 | -------- |
| Hooks | -------- | -------- | -------- | -------- | 710 | -------- | 250 | -------- |
| Pound nets | -------- | -------- | -------- | -------- | -------- | 131 | -------- | -------- |
| Fyke nets | 5 | -------- | 8 | -------- | 14 | 272 | 79 | 33 |
| Dip nets | -------- | -------- | -------- | -------- | -------- | 36 | -------- | -------- |
| Otter trawls, fish | -------- | 1 | -------- | -------- | -------- | 59 | -------- | -------- |
| Yards at mouth | -------- | 23 | -------- | -------- | -------- | 1,075 | -------- | -------- |
| Eel traps | -------- | -------- | -------- | -------- | -------- | 60 | -------- | -------- |
| Pots: | | | | | | | | |
| Eel | 5 | -------- | | -------- | 401 | 705 | 14 | 57 |
| Lobster | -------- | -------- | -------- | -------- | -------- | 8,736 | -------- | -------- |
| Harpoons | -------- | -------- | -------- | 1 | -------- | 3 | -------- | 1 |
| Spears | -------- | -------- | -------- | -------- | -------- | 52 | -------- | -------- |
| Dredges: | | | | | | | | |
| Oyster | -------- | -------- | -------- | -------- | -------- | 76 | -------- | -------- |
| Yards at mouth | -------- | -------- | -------- | -------- | -------- | 104 | -------- | -------- |
| Scallop | -------- | -------- | -------- | 2 | -------- | 2 | -------- | -------- |
| Yards at mouth | -------- | -------- | -------- | 7 | -------- | 7 | -------- | -------- |
| Tongs: | | | | | | | | |
| Oyster | -------- | -------- | -------- | -------- | -------- | 294 | -------- | -------- |
| Other | -------- | -------- | -------- | -------- | -------- | 1,154 | -------- | -------- |
| Rakes, other than for oysters | -------- | -------- | -------- | -------- | -------- | 107 | -------- | -------- |
| Forks | -------- | -------- | -------- | -------- | -------- | 352 | -------- | -------- |

### CATCH: BY COUNTIES

| Species | Albany | | Columbia | | Dutchess | | Greene | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 4,000 | $98 | 42,300 | $721 | 69,500 | $1,299 | 8,800 | $199 |
| Carp | 1,500 | 91 | 4,700 | 315 | 24,000 | 1,736 | 18,700 | 1,481 |
| Catfish and bullheads | 300 | 20 | 1,000 | 98 | 6,300 | 818 | 2,000 | 212 |
| Eels, common | -------- | -------- | 400 | 19 | 600 | 53 | 100 | 6 |
| Shad | -------- | -------- | 21,800 | 1,466 | 171,600 | 12,136 | 23,600 | 1,889 |
| Striped bass | -------- | -------- | -------- | -------- | 1,200 | 50 | -------- | -------- |
| Sturgeon | -------- | -------- | -------- | -------- | 900 | 221 | 100 | 18 |
| Suckers | 500 | 31 | 3,400 | 186 | 3,400 | 235 | 300 | 18 |
| Sunfish | -------- | -------- | 200 | 16 | 400 | 30 | -------- | -------- |
| White perch | 100 | 6 | 1,500 | 245 | 2,700 | 225 | 1,200 | 84 |
| Total | 6,400 | 246 | 75,300 | 3,066 | 280,600 | 16,803 | 54,800 | 3,907 |

| Species | Kings | | Nassau | | New York | | Orange | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | -------- | -------- | -------- | -------- | -------- | -------- | 23,100 | $315 |
| Bluefish | 328,900 | $26,654 | 47,400 | $3,130 | 192,800 | $15,627 | -------- | -------- |
| Bonito | -------- | -------- | 11,200 | 520 | -------- | -------- | -------- | -------- |
| Butterfish | 40,300 | 1,639 | 135,900 | 9,026 | 262,100 | 12,387 | -------- | -------- |
| Carp | -------- | -------- | -------- | -------- | -------- | -------- | 8,000 | 549 |
| Catfish and bullheads | -------- | -------- | -------- | -------- | -------- | -------- | 1,600 | 165 |
| Cod | 587,400 | 25,450 | 310,000 | 13,375 | 2,319,500 | 91,135 | -------- | -------- |
| Croaker | 1,900 | 19 | -------- | -------- | -------- | -------- | -------- | -------- |
| Cusk | -------- | -------- | -------- | -------- | 90,900 | 1,283 | -------- | -------- |
| Eels: | | | | | | | | |
| Common | 9,100 | 976 | -------- | -------- | -------- | -------- | 700 | 41 |
| Conger | -------- | -------- | -------- | -------- | 800 | 14 | -------- | -------- |
| Flounders: | | | | | | | | |
| Gray sole | -------- | -------- | -------- | -------- | 88,900 | 6,256 | -------- | -------- |
| Lemon sole | -------- | -------- | -------- | -------- | 145,800 | 9,610 | -------- | -------- |
| Yellowtail and dab | 232,600 | 8,510 | 34,000 | 1,700 | 1,206,900 | 46,210 | -------- | -------- |
| Blackback | 826,700 | 49,608 | 1,800 | 87 | 831,500 | 42,279 | -------- | -------- |
| Fluke | 935,300 | 42,795 | 232,400 | 11,643 | 446,500 | 22,242 | -------- | -------- |
| Unclassified | 150,000 | 7,500 | -------- | -------- | 501,300 | 25,040 | -------- | -------- |

## *Fisheries of New York, 1937*—Continued

### CATCH: BY COUNTIES—Continued

| Species | Kings | | Nassau | | New York | | Orange | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Frigate mackerel | -------- | -------- | 13,200 | $132 | -------- | -------- | -------- | -------- |
| Haddock | 1,500 | $56 | -------- | -------- | 2,242,400 | $74,283 | -------- | -------- |
| Hake | 24,400 | 898 | -------- | -------- | 292,400 | 3,201 | -------- | -------- |
| Halibut | -------- | -------- | -------- | -------- | 2,800 | 291 | -------- | -------- |
| King whiting or "kingfish" | -------- | -------- | 2,900 | 92 | 3,300 | 50 | -------- | -------- |
| Mackerel | 176,000 | 4,547 | 127,800 | 2,557 | 189,400 | 7,641 | -------- | -------- |
| Mummichog | 1,300 | 140 | -------- | -------- | -------- | -------- | -------- | -------- |
| Pollock | -------- | -------- | -------- | -------- | 21,800 | 419 | -------- | -------- |
| Rosefish | -------- | -------- | -------- | -------- | 1,500 | 15 | -------- | -------- |
| Scup or porgy | 155,500 | 3,475 | 88,600 | 3,481 | 80,600 | 2,425 | -------- | -------- |
| Sea bass | 12,700 | 1,019 | 187,600 | 11,273 | 83,400 | 6,663 | -------- | -------- |
| Sea robin | 7,000 | 140 | 500 | 11 | -------- | -------- | -------- | -------- |
| Shad | 6,700 | 807 | 3,600 | 360 | -------- | -------- | 26,700 | $1,674 |
| Sharks | 200 | 5 | -------- | -------- | -------- | -------- | -------- | -------- |
| Skates | 24,800 | 430 | -------- | -------- | -------- | -------- | -------- | -------- |
| Smelt | -------- | -------- | -------- | -------- | -------- | -------- | 200 | 38 |
| Spanish mackerel | -------- | -------- | 100 | 2 | -------- | -------- | -------- | -------- |
| Squeteagues or "sea trout," gray | 300,000 | 9,000 | 124,000 | 4,960 | 1,600 | 64 | -------- | -------- |
| Squirrel hake | 3,000 | 60 | 1,900 | 36 | -------- | -------- | -------- | -------- |
| Striped bass | -------- | -------- | 14,500 | 1,148 | -------- | -------- | -------- | -------- |
| Suckers | -------- | -------- | -------- | -------- | -------- | -------- | 1,000 | 64 |
| Sunfish | -------- | -------- | -------- | -------- | -------- | -------- | 200 | 11 |
| Swordfish | 200 | 22 | -------- | -------- | 75,700 | 13,927 | -------- | -------- |
| Tautog | 1,200 | 12 | -------- | -------- | -------- | -------- | -------- | -------- |
| Thimble-eyed mackerel | 1,900 | 57 | 46,000 | 1,420 | -------- | -------- | -------- | -------- |
| Tilefish | 240,000 | 9,540 | -------- | -------- | 2,115,600 | 90,567 | -------- | -------- |
| Tomcod | -------- | -------- | -------- | -------- | -------- | -------- | 100 | 10 |
| White perch | -------- | -------- | -------- | -------- | -------- | -------- | 700 | 60 |
| Whiting | 4,073,400 | 67,099 | 464,700 | 6,534 | 39,900 | 699 | -------- | -------- |
| Wolffish | -------- | -------- | -------- | -------- | 5,800 | 139 | -------- | -------- |
| Crabs, hard | 28,500 | 864 | -------- | -------- | -------- | -------- | -------- | -------- |
| Lobsters | 196,000 | 39,200 | 18,000 | 3,600 | 500 | 57 | -------- | -------- |
| Shrimp | -------- | -------- | -------- | -------- | 58,200 | 1,846 | -------- | -------- |
| Clams: | | | | | | | | |
| Hard, public | 17,600 | 2,000 | 351,600 | 66,335 | -------- | -------- | -------- | -------- |
| Hard, private | -------- | -------- | 24,000 | 4,500 | -------- | -------- | -------- | -------- |
| Soft, public | -------- | -------- | 253,200 | 21,578 | -------- | -------- | -------- | -------- |
| Surf | 770,000 | 50,012 | 201,800 | 10,102 | -------- | -------- | -------- | -------- |
| Conchs | 12,600 | 1,236 | -------- | -------- | -------- | -------- | -------- | -------- |
| Mussels, sea | -------- | -------- | 25,900 | 1,374 | -------- | -------- | -------- | -------- |
| Oysters, market: | | | | | | | | |
| Public, spring | -------- | -------- | 5,900 | 991 | -------- | -------- | -------- | -------- |
| Public, fall | -------- | -------- | 8,800 | 1,425 | -------- | -------- | -------- | -------- |
| Private, spring | -------- | -------- | 1,176,800 | 208,294 | 5,300 | 938 | -------- | -------- |
| Private, fall | -------- | -------- | 1,389,800 | 241,825 | 44,200 | 7,691 | -------- | -------- |
| Scallops: | | | | | | | | |
| Bay | -------- | -------- | 100 | 46 | -------- | -------- | -------- | -------- |
| Sea | 722,400 | 94,029 | 107,300 | 13,600 | 1,904,200 | 211,507 | -------- | -------- |
| Squid | 90,000 | 3,243 | 99,100 | 3,017 | 3,600 | 102 | -------- | -------- |
| Bloodworms | 3,200 | 920 | 9,200 | 6,900 | -------- | -------- | -------- | -------- |
| Sandworms | 4,700 | 432 | 14,200 | 10,600 | -------- | -------- | -------- | -------- |
| Total | 9,987,000 | 452,394 | 5,533,800 | 665,674 | 13,259,200 | 694,608 | 62,300 | 2,927 |

| Species | Putnam | | Queens | | Rensselaer | | Richmond | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 400 | $8 | -------- | -------- | 4,000 | $43 | -------- | -------- |
| Bluefish | -------- | -------- | -------- | -------- | -------- | -------- | 33,000 | $2,680 |
| Carp | 2,500 | 124 | -------- | -------- | 29,300 | 1,919 | -------- | -------- |
| Catfish and bullheads | 600 | 53 | -------- | -------- | 700 | 78 | -------- | -------- |
| Cod | -------- | -------- | 200 | $4 | -------- | -------- | 24,400 | 1,252 |
| Eels, common | 800 | 48 | -------- | -------- | 100 | 11 | -------- | -------- |
| Flounders: | | | | | | | | |
| Gray sole | -------- | -------- | 200 | 5 | -------- | -------- | -------- | -------- |
| Yellowtail and dab | -------- | -------- | 35,500 | 597 | -------- | -------- | -------- | -------- |
| Blackback | -------- | -------- | 2,000 | 80 | -------- | -------- | -------- | -------- |
| Shad | 5,000 | 500 | -------- | -------- | 100 | 5 | -------- | -------- |
| Striped bass | 200 | 26 | -------- | -------- | 100 | 7 | -------- | -------- |
| Suckers | 500 | 21 | -------- | -------- | 13,800 | 910 | -------- | -------- |
| Sunfish | 100 | 3 | -------- | -------- | -------- | -------- | -------- | -------- |
| Swordfish | -------- | -------- | -------- | -------- | -------- | -------- | 1,800 | 324 |
| White perch | 900 | 65 | -------- | -------- | 600 | 46 | -------- | -------- |
| Scallops, sea | -------- | -------- | -------- | -------- | -------- | -------- | 84,800 | 10,119 |
| Total | 11,000 | 848 | 37,900 | 686 | 48,700 | 3,019 | 144,000 | 14,375 |

## *Fisheries of New York, 1937*—Continued

### CATCH: By counties—Continued

| Species | Rockland | | Suffolk | | Ulster | | Westchester | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 9,900 | $291 | 14,400 | $140 | 43,600 | $745 | 1,800 | $30 |
| Bluefish | | | 256,000 | 20,301 | | | | |
| Bonito | | | 39,200 | 1,541 | | | | |
| Butterfish | | | 1,461,900 | 89,413 | | | | |
| Carp | 1,900 | 76 | | | 35,300 | 2,526 | 9,800 | 649 |
| Catfish and bullheads | 700 | 72 | | | 5,900 | 591 | 5,000 | 372 |
| Cod | | | 561,000 | 22,602 | | | | |
| Croaker | | | 28,000 | 296 | | | | |
| Drum, red or redfish | | | 100 | 1 | | | | |
| Eels: | | | | | | | | |
| Common | 29,400 | 1,530 | 122,200 | 6,725 | 2,000 | 235 | 7,000 | 431 |
| Conger | | | 200 | 8 | | | | |
| Flounders: | | | | | | | | |
| Yellowtail and dab | | | 1,308,000 | 69,562 | | | | |
| Blackback | | | 1,074,800 | 53,822 | | | | |
| Fluke | | | 484,100 | 27,433 | | | | |
| Unclassified | | | 27,800 | 1,413 | | | | |
| Frigate mackerel | | | 13,300 | 133 | | | | |
| Grayfish | | | 100 | 2 | | | | |
| Haddock | | | 38,000 | 1,418 | | | | |
| Hake | | | 400 | 8 | | | | |
| Herring, sea | | | 4,600 | 46 | | | | |
| King whiting or "kingfish" | | | 66,400 | 751 | | | | |
| Mackerel | | | 954,700 | 20,333 | | | | |
| Menhaden | | | 31,892,000 | 164,431 | | | | |
| Pollock | | | 94,300 | 2,599 | | | | |
| Scup or porgy | | | 1,382,400 | 41,068 | | | | |
| Sea bass | | | 243,700 | 19,602 | | | | |
| Sea robin | | | 8,500 | 174 | | | | |
| Shad | 152,600 | 11,035 | 35,100 | 2,505 | 343,000 | 23,980 | 231,600 | 20,506 |
| Sharks | | | 22,000 | 1,132 | | | | |
| Skates | | | 38,500 | 212 | | | | |
| Smelt | | | | | 400 | 38 | | |
| Spot | | | 300 | 5 | | | | |
| Squeteagues or "sea trout," gray | | | 1,031,500 | 44,687 | | | | |
| Squirrel hake | | | 100 | 2 | | | | |
| Striped bass | 15,500 | 2,293 | 96,900 | 7,870 | 100 | 8 | 3,500 | 300 |
| Sturgeon | | | 100 | 12 | | | 100 | 24 |
| Suckers | 1,600 | 125 | | | 2,800 | 185 | 2,600 | 211 |
| Sunfish | | | | | 700 | 33 | | |
| Swellfish | | | 56,100 | 579 | | | | |
| Swordfish | | | 23,400 | 4,693 | | | 7,900 | 1,250 |
| Tautog | | | 4,700 | 68 | | | | |
| Tilefish | | | 34,000 | 1,757 | | | | |
| Tomcod | | | | | | | 3,000 | 110 |
| Tuna | | | 43,400 | 2,218 | | | | |
| White perch | 9,000 | 593 | | | 2,300 | 201 | 10,500 | 526 |
| Whiting | | | 611,200 | 12,785 | | | | |
| Crabs: | | | | | | | | |
| Hard | | | 482,600 | 10,486 | | | | |
| Soft and peelers | | | 12,500 | 2,500 | | | | |
| Lobsters | | | 152,300 | 32,836 | | | | |
| Shrimp | | | 20,600 | 5,150 | | | | |
| Clams: | | | | | | | | |
| Hard, public | | | 1,778,700 | 306,208 | | | | |
| Hard, private | | | 359,500 | 63,414 | | | | |
| Soft, public | | | 516,800 | 63,867 | | | | |
| Soft, private | | | 12,800 | 1,536 | | | | |
| Mussels, sea | | | 64,800 | 3,888 | | | | |
| Oysters, market: | | | | | | | | |
| Public, spring | | | 493,800 | 82,959 | | | | |
| Public, fall | | | 191,400 | 31,007 | | | | |
| Private, spring | | | 3,045,600 | 539,071 | | | | |
| Private, fall | | | 3,422,900 | 595,585 | | | | |
| Scallops, bay | | | 35,900 | 8,604 | | | | |
| Squid | | | 1,014,500 | 38,109 | | | | |
| Bloodworms | | | 22,300 | 19,220 | | | | |
| Sandworms | | | 19,600 | 16,740 | | | | |
| Total | 220,600 | 16,015 | 53,720,000 | 2,443,527 | 436,100 | 28,542 | 282,800 | 24,409 |

*Fisheries of New York, 1937*—Continued

### SEED OYSTER FISHERY: BY GEAR

| Item | Dredges | | Tongs | | Total, exclusive of duplication | |
|---|---|---|---|---|---|---|
| OPERATING UNITS | | | | | | |
| Fishermen: | *Number* | | *Number* | | *Number* | |
| On vessels | 28 | | | | 28 | |
| On boats and shore: | | | | | | |
| Regular | | | 109 | | 109 | |
| Casual | | | 39 | | 39 | |
| Total | 28 | | 148 | | 176 | |
| Vessels, motor | 5 | | | | 5 | |
| Net tonnage | 149 | | | | 149 | |
| Boats: | | | | | | |
| Motor | | | 20 | | 20 | |
| Other | | | 128 | | 128 | |
| Apparatus: | | | | | | |
| Number | 10 | | 148 | | | |
| Yards at mouth | 19 | | | | | |
| CATCH | | | | | | |
| Oysters, seed: | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* |
| Public, spring | | | 39, 829 | $34, 995 | 39, 829 | $34, 995 |
| Private, spring | 12, 783 | $13, 760 | | | 12, 783 | 13, 760 |
| Public, fall | | | 5, 766 | 4, 996 | 5, 766 | 4, 996 |
| Private, fall | 32, 161 | 33, 290 | | | 32, 161 | 33, 290 |
| Total | 44, 944 | 47, 050 | 45, 595 | 39, 991 | 90, 539 | 87, 041 |

### SEED OYSTER FISHERY: BY COUNTIES

| Item | Nassau | | Suffolk | |
|---|---|---|---|---|
| OPERATING UNITS | | | | |
| Fishermen: | *Number* | | *Number* | |
| On vessels | | | 28 | |
| On boats and shore: | | | | |
| Regular | 6 | | 103 | |
| Casual | 6 | | 33 | |
| Total | 12 | | 164 | |
| Vessels, motor | | | 5 | |
| Net tonnage | | | 149 | |
| Boats: | | | | |
| Motor | 2 | | 18 | |
| Other | 10 | | 118 | |
| Apparatus: | | | | |
| Dredges | | | 10 | |
| Yards at mouth | | | 19 | |
| Tongs | | | 148 | |
| CATCH | | | | |
| Oyster, seed: | *Bushels* | *Value* | *Bushels* | *Value* |
| Public, spring | 1, 585 | $1, 280 | 38, 244 | $33, 715 |
| Private, spring | | | 12, 783 | 13, 760 |
| Public, fall | 386 | 221 | 5, 380 | 4, 775 |
| Private, fall | | | 32, 161 | 33, 290 |
| Total | 1, 971 | 1, 501 | 88, 568 | 85, 540 |

NOTE.—Of the total number of persons fishing for seed oysters, 156 are duplicated among those fishing for market oysters or other species. Similarly the following craft and gear are duplicated: 1 motor vessel, 20 motorboats, 128 other boats, 2 dredges, and 148 tongs.

## NEW JERSEY

### *Fisheries of New Jersey, 1937*

OPERATING UNITS: BY GEAR

| Item | Purse seines | | Haul seines | Gill nets | | | | Lines | |
|---|---|---|---|---|---|---|---|---|---|
| | Menhaden | Other | | Anchor | Drift | Run-around | Stake | Hand | Trawl |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 126 | 94 | -------- | -------- | 8 | -------- | -------- | 58 | 54 |
| On boats and shore: | | | | | | | | | |
| Regular | -------- | -------- | 73 | 4 | 104 | 109 | 51 | 204 | 142 |
| Casual | -------- | -------- | 218 | 2 | 82 | 11 | 252 | 64 | 53 |
| Total | 126 | 94 | 291 | 6 | 194 | 120 | 303 | 326 | 249 |
| Vessels, motor: | | | | | | | | | |
| 5 to 10 tons | -------- | 1 | -------- | -------- | 1 | -------- | -------- | 5 | 7 |
| 11 to 20 tons | -------- | 2 | -------- | -------- | 1 | -------- | -------- | 5 | 12 |
| 21 to 30 tons | -------- | 3 | -------- | -------- | -------- | -------- | -------- | 1 | -------- |
| 31 to 40 tons | 5 | 1 | -------- | -------- | -------- | -------- | -------- | 1 | -------- |
| 41 to 50 tons | -------- | 1 | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| 141 to 150 tons | 1 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Total | 6 | 8 | -------- | -------- | 2 | -------- | -------- | 12 | 19 |
| Net tonnage | 332 | 192 | -------- | -------- | 17 | -------- | -------- | 155 | 197 |
| Boats: | | | | | | | | | |
| Motor | -------- | -------- | 3 | 3 | 64 | 52 | 44 | 138 | 90 |
| Other | -------- | -------- | 119 | -------- | 42 | -------- | 95 | 8 | -------- |
| Accessory boats | 18 | 11 | -------- | -------- | 3 | -------- | -------- | 21 | 22 |
| Apparatus: | | | | | | | | | |
| Number | 6 | 8 | 121 | 6 | 678 | 52 | 579 | 444 | 566 |
| Length, yards | 1,680 | 2,790 | 9,573 | | | | | | |
| Square yards | -------- | -------- | -------- | 9,340 | 470,822 | 189,590 | 219,175 | -------- | -------- |
| Hooks, baits, or snoods | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 885 | 373,000 |

| Item | Lines—Continued | | | Pound nets | Weirs | Stop nets | Fyke nets | Dip nets | Cast nets |
|---|---|---|---|---|---|---|---|---|---|
| | Troll | Trot with baits or snoods | Trot with hooks | | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 22 | -------- | -------- | 242 | -------- | -------- | -------- | -------- | -------- |
| On boats and shore: | | | | | | | | | |
| Regular | 71 | 16 | -------- | 112 | -------- | 23 | 34 | 15 | -------- |
| Casual | 57 | 12 | 1 | 24 | 15 | 67 | 68 | 13 | 3 |
| Total | 150 | 28 | 1 | 378 | 15 | 90 | 102 | 28 | 3 |
| Vessels, motor: | | | | | | | | | |
| 5 to 10 tons | 2 | -------- | -------- | 36 | -------- | -------- | -------- | -------- | -------- |
| 11 to 20 tons | 1 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| 21 to 30 tons | 1 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Total | 4 | -------- | -------- | 36 | -------- | -------- | -------- | -------- | -------- |
| Net tonnage | 53 | -------- | -------- | 224 | -------- | -------- | -------- | -------- | -------- |
| Boats: | | | | | | | | | |
| Motor | 113 | 16 | -------- | 23 | 6 | 9 | 24 | 4 | -------- |
| Other | -------- | 5 | 1 | 13 | 1 | 44 | 37 | 22 | -------- |
| Accessory boats | 8 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Apparatus: | | | | | | | | | |
| Number | 482 | 21 | 1 | 191 | 91 | 59 | 832 | 28 | 3 |
| Square, yards | -------- | -------- | -------- | -------- | -------- | 63,317 | -------- | -------- | -------- |
| Hooks, baits or snoods | 482 | 14,806 | 150 | -------- | -------- | -------- | -------- | -------- | -------- |

## *Fisheries of New Jersey, 1937*—Continued

### OPERATING UNITS: BY GEAR—Continued

| Item | Drag nets | Drop nets | Push nets | Otter trawls | Wire baskets | Pots | |
|---|---|---|---|---|---|---|---|
| | | | | | | Crab | Eel |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | -------- | -------- | -------- | 140 | -------- | -------- | -------- |
| On boats and shore: | | | | | | | |
| Regular | 6 | 1 | 11 | 44 | -------- | 2 | 23 |
| Casual | 3 | -------- | 2 | 6 | 1 | -------- | 29 |
| Total | 9 | 1 | 13 | 190 | 1 | 2 | 52 |
| Vessels, motor: | | | | | | | |
| 5 to 10 tons | -------- | -------- | -------- | 6 | -------- | -------- | -------- |
| 11 to 20 tons | -------- | -------- | -------- | 19 | -------- | -------- | -------- |
| 21 to 30 tons | -------- | -------- | -------- | 2 | -------- | -------- | -------- |
| 31 to 40 tons | -------- | -------- | -------- | 5 | -------- | -------- | -------- |
| 41 to 50 tons | -------- | -------- | -------- | 2 | -------- | -------- | -------- |
| 51 to 60 tons | -------- | -------- | -------- | 1 | -------- | -------- | -------- |
| 71 to 80 tons | -------- | -------- | -------- | 1 | -------- | -------- | -------- |
| Total | -------- | -------- | -------- | 36 | -------- | -------- | -------- |
| Net tonnage | -------- | -------- | -------- | 746 | -------- | -------- | -------- |
| Boats: | | | | | | | |
| Motor | 6 | -------- | 10 | 24 | 1 | 1 | 21 |
| Other | -------- | 1 | 2 | -------- | -------- | -------- | 16 |
| Apparatus: | | | | | | | |
| Number | 12 | 40 | 13 | 60 | 25 | 10 | 1,476 |
| Yards at mouth | 24 | -------- | -------- | 1,367 | -------- | -------- | -------- |

| Item | Pots—Contd. | | Spears | Dredges | | | |
|---|---|---|---|---|---|---|---|
| | Fish | Lobster | | Clam | Crab | Oyster | Scallop |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | -------- | -------- | -------- | 78 | 21 | 427 | 24 |
| On boats and shore: | | | | | | | |
| Regular | 53 | 87 | 35 | 11 | 6 | 28 | -------- |
| Casual | 13 | 7 | 5 | 6 | -------- | 2 | -------- |
| Total | 66 | 94 | 40 | 95 | 27 | 457 | 24 |
| Vessels: | | | | | | | |
| Motor: | | | | | | | |
| 5 to 10 tons | -------- | -------- | -------- | 10 | 5 | 10 | -------- |
| 11 to 20 tons | -------- | -------- | -------- | 13 | 3 | 38 | -------- |
| 21 to 30 tons | -------- | -------- | -------- | -------- | -------- | 15 | 1 |
| 31 to 40 tons | -------- | -------- | -------- | -------- | -------- | 4 | 2 |
| 51 to 60 tons | -------- | -------- | -------- | -------- | -------- | 5 | -------- |
| Total | -------- | -------- | -------- | 23 | 8 | 72 | 3 |
| Net tonnage | -------- | -------- | -------- | 269 | 85 | 1,418 | 92 |
| Sail: | | | | | | | |
| 5 to 10 tons | -------- | -------- | -------- | 2 | 1 | -------- | -------- |
| 11 to 20 tons | -------- | -------- | -------- | 1 | -------- | 1 | -------- |
| Total | -------- | -------- | -------- | 3 | 1 | 1 | -------- |
| Net tonnage | -------- | -------- | -------- | 32 | 8 | 18 | -------- |
| Total vessels | -------- | -------- | -------- | 26 | 9 | 73 | 3 |
| Total net tonnage | -------- | -------- | -------- | 301 | 93 | 1,436 | 92 |
| Boats: | | | | | | | |
| Motor | 42 | 47 | -------- | 10 | 4 | 15 | -------- |
| Other | -------- | -------- | 40 | -------- | -------- | -------- | -------- |
| Apparatus: | | | | | | | |
| Number | 10,047 | 9,699 | 40 | 72 | 58 | 176 | 6 |
| Yards at mouth | -------- | -------- | -------- | 74 | 84 | 214 | 20 |

## *Fisheries of New Jersey, 1937*—Continued

### OPERATING UNITS: BY GEAR—Continued

| Item | Tongs | | Rakes | | Hoes | By hand | | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| | Oyster | Other | Oyster | Other | | Oyster | Other | |
| **Fishermen:** | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | | | | | 1,132 |
| On boats and shore: | | | | | | | | |
| Regular | 66 | 337 | 34 | 410 | 60 | 2 | 126 | 992 |
| Casual | 121 | 235 | | 461 | 41 | 14 | 248 | 1,581 |
| Total | 187 | 572 | 34 | 871 | 101 | 16 | 374 | 3,705 |
| **Vessels:** | | | | | | | | |
| Motor: | | | | | | | | |
| 5 to 10 tons | | | | | | | | 68 |
| 11 to 20 tons | | | | | | | | 73 |
| 21 to 30 tons | | | | | | | | 21 |
| 31 to 40 tons | | | | | | | | 15 |
| 41 to 50 tons | | | | | | | | 2 |
| 51 to 60 tons | | | | | | | | 6 |
| 71 to 80 tons | | | | | | | | 1 |
| 141 to 150 tons | | | | | | | | 1 |
| Total | | | | | | | | 187 |
| Net tonnage | | | | | | | | 3,197 |
| Sail: | | | | | | | | |
| 5 to 10 tons | | | | | | | | 2 |
| 11 to 20 tons | | | | | | | | 1 |
| Total | | | | | | | | 3 |
| Net tonnage | | | | | | | | 32 |
| Total vessels | | | | | | | | 189 |
| Total net tonnage | | | | | | | | 3,229 |
| **Boats:** | | | | | | | | |
| Motor | 63 | 296 | 22 | 310 | 20 | | 69 | 971 |
| Other | 117 | 255 | 9 | 546 | 75 | 3 | 254 | 1,317 |
| Accessory boats | | | | | | | | 71 |
| Apparatus, number | 187 | 572 | 34 | 871 | 101 | | | |

### CATCH: BY GEAR

| Species | Purse seines | | | | Haul seines | | Gill nets | |
|---|---|---|---|---|---|---|---|---|
| | Menhaden | | Other | | | | Anchor | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | 68,400 | $719 | | |
| Bluefish | | | 74,800 | $4,738 | | | 700 | $60 |
| Bonito | | | 3,100 | 132 | | | | |
| Butterfish | | | 31,200 | 1,262 | | | | |
| Carp | | | | | 126,700 | 8,361 | | |
| Catfish and bullheads | | | | | 21,100 | 877 | | |
| Cod | | | 69,400 | 2,500 | | | | |
| Croaker | | | 522,300 | 7,207 | 9,700 | 227 | | |
| Eels, common | | | | | 58,200 | 3,841 | | |
| Flounders: | | | | | | | | |
| Blackback | | | | | 300 | 30 | | |
| Fluke | | | 2,900 | 280 | 5,400 | 623 | | |
| Frigate mackerel | | | 300 | 3 | | | | |
| Herring, sea | | | 2,000 | 27 | | | | |
| Hickory shad | | | 600 | 12 | | | | |
| King whiting or "kingfish" | | | 300 | 4 | 700 | 42 | | |
| Mackerel | | | 5,100 | 474 | | | | |
| Menhaden | 51,510,000 | $210,073 | 10,687,000 | 35,635 | | | 2,000 | 20 |
| Scup or porgy | | | 453,600 | 9,474 | | | 100 | 2 |
| Sea bass | | | 14,700 | 955 | | | | |
| Shad | | | 100 | 5 | 73,900 | 15,366 | 7,300 | 900 |
| Spanish mackerel | | | 300 | 19 | | | | |
| Spot | | | 200 | 4 | | | | |
| Squeteagues or "sea trout," gray | | | 2,120,600 | 39,913 | 25,600 | 1,680 | 1,100 | 45 |
| Striped bass | | | 8,100 | 812 | 83,100 | 11,635 | | |

### *Fisheries of New Jersey, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Purse seines | | | | Haul seines | | Gill nets | |
|---|---|---|---|---|---|---|---|---|
| | Menhaden | | Other | | | | Anchor | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Suckers | | | | | 20,900 | $1,076 | | |
| White perch | | | | | 33,300 | 3,328 | | |
| Whiting | | | 3,400 | $34 | | | | |
| Yellow perch | | | | | 1,400 | 150 | | |
| Crabs: | | | | | | | | |
| Hard | | | | | 10,700 | 1,095 | | |
| Soft and peelers | | | | | 14,400 | 4,570 | | |
| Shrimp | | | | | 3,000 | 750 | | |
| Total | 51,510,000 | $210,073 | 14,000,000 | 103,490 | 556,800 | 54,370 | 11,200 | $1,027 |

| Species | Gill nets—Continued | | | | | | Lines | |
|---|---|---|---|---|---|---|---|---|
| | Drift | | Runaround | | Stake | | Hand | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | 2,400 | $24 | | |
| Bluefish | 7,900 | $946 | 127,000 | $10,267 | | | 417,900 | $30,147 |
| Bonito | 100 | 8 | | | | | 700 | 42 |
| Butterfish | 2,400 | 93 | | | | | | |
| Carp | | | | | 10,000 | 800 | | |
| Cod | | | | | | | 19,000 | 609 |
| Croaker | 93,100 | 1,453 | 1,000 | 10 | | | 16,200 | 464 |
| Eels: | | | | | | | | |
| Common | | | | | | | 5,500 | 396 |
| Conger | | | | | | | 300 | 3 |
| Flounders: | | | | | | | | |
| Blackback | | | | | | | 100 | 10 |
| Fluke | | | | | | | 10,000 | 958 |
| Groupers | | | | | | | 21,500 | 978 |
| Mackerel | 372,900 | 19,519 | 37,100 | 1,146 | | | | |
| Pompano | | | | | | | 100 | 35 |
| Scup or porgy | | | 600 | 6 | | | 37,500 | 506 |
| Sea bass | | | | | | | 325,700 | 23,528 |
| Shad | 168,100 | 14,402 | | | 1,944,300 | 168,137 | | |
| Sharks | 100 | 3 | | | | | | |
| Snapper, red | | | | | | | 53,900 | 3,794 |
| Spot | 500 | 10 | | | | | | |
| Squeteagues or "sea trout," gray | 122,000 | 3,832 | 271,800 | 11,539 | 3,700 | 242 | 45,000 | 1,966 |
| Striped bass | 2,000 | 232 | | | 121,600 | 15,385 | 200 | 30 |
| Sturgeon | 2,000 | 150 | | | | | | |
| Tautog | | | | | | | 2,700 | 54 |
| White perch | 1,200 | 100 | | | 15,300 | 1,398 | | |
| Whiting | 100 | 2 | | | | | 800 | 15 |
| Crabs, hard | | | 3,100 | 90 | 1,100 | 30 | | |
| Total | 772,400 | 40,750 | 440,600 | 23,058 | 2,098,400 | 186,016 | 957,100 | 63,535 |

| Species | Lines—Continued | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Trawl | | Troll | | Trot with baits or snoods | | Trot with hooks | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | | | 475,900 | $33,457 | | | | |
| Bonito | | | 47,200 | 2,726 | | | | |
| Cero | 51,100 | $1,272 | | | | | | |
| Cod | 2,244,800 | 58,648 | | | | | | |
| Frigate mackerel | | | 300 | 10 | | | | |
| Kingfish or "king mackerel" | | | 149,500 | 5,677 | | | | |
| Mackerel | | | 15,900 | 711 | | | | |
| Skates | 1,900 | 10 | | | | | | |
| Tuna | | | 4,400 | 210 | | | | |
| Crabs: | | | | | | | | |
| Hard | | | | | 132,300 | $6,016 | | |
| Soft and peelers | | | | | 600 | 225 | | |
| Turtles, snapper | | | | | | | 4,000 | $200 |
| Total | 2,297,800 | 59,930 | 693,200 | 42,791 | 132,900 | 6,241 | 4,000 | 200 |

*Fisheries of New Jersey, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Pound nets | | Weirs | | Stop nets | | Fyke nets | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 352,300 | $3,479 | | | | | | |
| Bluefish | 373,200 | 21,468 | | | | | | |
| Bonito | 123,300 | 4,534 | | | | | | |
| Butterfish | 2,554,500 | 95,248 | | | | | | |
| Carp | | | | | 183,700 | $13,398 | | |
| Catfish and bullheads | | | | | 3,000 | 167 | 36,100 | $1,402 |
| Cod | 189,100 | 4,585 | | | | | | |
| Croaker | 2,147,200 | 37,541 | | | | | | |
| Drum: | | | | | | | | |
| Black | 5,100 | 73 | | | | | | |
| Red or redfish | 9,800 | 194 | | | | | | |
| Eels: | | | | | | | | |
| Common | 21,800 | 3,439 | | | | | 25,700 | 3,221 |
| Conger | 3,400 | 65 | | | | | | |
| Flounders: | | | | | | | | |
| Gray sole | 2,000 | 80 | | | | | | |
| Yellowtail and dab | 5,000 | 194 | | | | | | |
| Blackback | 20,300 | 828 | | | | | 89,600 | 3,483 |
| Fluke | 188,000 | 14,487 | | | | | | |
| Frigate mackerel | 157,600 | 1,912 | | | | | | |
| Grayfish | 50,900 | 509 | | | | | | |
| Hake | 3,100 | 80 | | | | | | |
| Herring, sea | 363,900 | 3,473 | | | | | | |
| Hickory shad | 1,400 | 20 | | | | | | |
| King whiting or "kingfish" | 68,600 | 2,763 | | | | | | |
| Mackerel | 1,234,100 | 37,061 | | | | | | |
| Menhaden | 5,557,000 | 18,587 | | | | | | |
| Mullet | 500 | 14 | | | | | | |
| Pollock | 1,400 | 41 | | | | | | |
| Rudderfish | 2,100 | 21 | | | | | | |
| Scup or porgy | 2,771,400 | 48,045 | | | | | | |
| Sea bass | 90,000 | 5,153 | | | | | | |
| Sea robin | 48,900 | 489 | | | | | | |
| Shad | 1,145,600 | 123,896 | | | | | | |
| Sharks | 43,100 | 675 | | | | | | |
| Skates | 54,200 | 395 | | | | | | |
| Spanish mackerel | 50,000 | 4,181 | | | | | | |
| Spot | 13,800 | 290 | | | | | | |
| Squeteagues or "sea trout," gray | 7,432,900 | 219,385 | | | | | | |
| Squirrel hake | 114,800 | 1,158 | | | | | | |
| Striped bass | 800 | 74 | | | | | 25,400 | 3,570 |
| Sturgeon | 600 | 80 | | | | | | |
| Suckers | | | | | 200 | 14 | | |
| Swellfish | 100 | 1 | | | | | | |
| Tautog | 8,600 | 180 | | | | | | |
| Thimble-eyed mackerel | 15,100 | 275 | | | | | | |
| Tuna | 46,300 | 1,538 | | | | | | |
| White perch | | | | | | | 33,100 | 3,410 |
| Whiting | 8,243,100 | 84,509 | | | | | | |
| Yellow perch | | | | | | | 4,300 | 516 |
| Yellowtail | 700 | 14 | | | | | | |
| Crabs: | | | | | | | | |
| Hard | 20,900 | 500 | | | | | | |
| King | 1,760,300 | 5,021 | 998,200 | $2,170 | | | 8,000 | 30 |
| Soft and peelers | 100 | 1 | | | | | | |
| Lobsters | 200 | 22 | | | | | | |
| Squid | 978,400 | 18,430 | | | | | | |
| Turtles: | | | | | | | | |
| Hawksbill | 3,900 | 78 | | | | | | |
| Loggerhead | 6,700 | 122 | | | | | | |
| Snapper | | | | | | | 4,200 | 311 |
| Total | 36,286,100 | 765,208 | 998,200 | 2,170 | 186,900 | 13,579 | 226,400 | 15,943 |

| Species | Dip nets | | Cast nets | | Drag nets | | Drop nets | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Carp | | | 3,500 | $265 | | | | |
| Crabs: | | | | | | | | |
| Hard | 15,600 | $1,841 | | | | | 500 | $216 |
| Soft and peelers | 40,700 | 13,885 | | | | | | |
| Shrimp | | | | | 13,800 | $3,450 | | |
| Total | 56,300 | 15,726 | 3,500 | 265 | 13,800 | 3,450 | 500 | 216 |

## *Fisheries of New Jersey, 1937*—Continued

### CATCH: BY GEAR—Continued

| Species | Push nets | | Otter trawls | | Wire baskets | | Pots | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Crab | | Eel | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | | | 6,700 | $524 | | | | | | |
| Butterfish | | | 467,600 | 20,272 | | | | | | |
| Cod | | | 41,200 | 1,437 | | | | | | |
| Croaker | | | 1,144,800 | 20,541 | | | | | | |
| Drum, red or redfish | | | 300 | 6 | | | | | | |
| Eels: | | | | | | | | | | |
| Common | | | | | | | | | 140,700 | $13,000 |
| Conger | | | 26,400 | 439 | | | | | | |
| Flounders: | | | | | | | | | | |
| Gray sole | | | 3,100 | 83 | | | | | | |
| Yellowtail and dab | | | 8,800 | 173 | | | | | | |
| Blackback | | | 24,200 | 726 | | | | | | |
| Fluke | | | 1,945,900 | 155,559 | | | | | | |
| Grayfish | | | 6,700 | 34 | | | | | | |
| Hake | | | 46,400 | 1,357 | | | | | | |
| King whiting or "kingfish" | | | 8,700 | 239 | | | | | | |
| Mackerel | | | 4,000 | 482 | | | | | | |
| Pigfish | | | 100 | 2 | | | | | | |
| Pollock | | | 100 | 4 | | | | | | |
| Scup or porgy | | | 1,780,700 | 26,674 | | | | | | |
| Sea bass | | | 316,600 | 20,154 | | | | | | |
| Sea robin | | | 6,500 | 108 | | | | | | |
| Shad | | | 200 | 24 | | | | | | |
| Sharks | | | 500 | 12 | | | | | | |
| Skates | | | 1,600 | 32 | | | | | | |
| Spot | | | 300 | 6 | | | | | | |
| Squeteagues or "sea trout," gray | | | 491,400 | 12,230 | | | | | | |
| Sturgeon | | | 3,700 | 415 | | | | | | |
| Tautog | | | 1,100 | 16 | | | | | | |
| Tilefish | | | 300 | 15 | | | | | | |
| Whiting | | | 376,300 | 7,249 | | | | | | |
| Crabs: | | | | | | | | | | |
| Hard | | | 400 | 25 | 200 | $25 | 12,000 | $1,500 | | |
| Soft and peelers | | | | | 200 | 50 | 3,600 | 1,350 | | |
| Lobsters | | | 9,100 | 1,049 | | | | | | |
| Shrimp | 20,300 | $5,075 | | | | | | | | |
| Scallops, sea | | | 100 | 9 | | | | | | |
| Squid | | | 167,300 | 3,956 | | | | | | |
| Total | 20,300 | 5,075 | 6,891,100 | 273,852 | 400 | 75 | 15,600 | 2,850 | 140,700 | 13,000 |

| Species | Pots—Continued | | | | Spears | | Dredges | |
|---|---|---|---|---|---|---|---|---|
| | Fish | | Lobster | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 200 | $16 | | | | | | |
| Cod | 1,400 | 36 | | | | | | |
| Eels: | | | | | | | | |
| Common | | | | | 20,500 | $2,410 | | |
| Conger | 900 | 13 | | | | | | |
| Scup or porgy | 900 | 11 | | | | | | |
| Sea bass | 1,335,300 | 64,357 | 29,000 | $1,687 | | | | |
| Squeteagues or "sea trout," gray | 1,100 | 17 | | | | | | |
| Squirrel hake | 400 | 4 | | | | | | |
| Tautog | 1,800 | 39 | | | | | | |
| Crabs, hard | | | | | | | 252,300 | $8,244 |
| Lobsters | 35,000 | 8,916 | 224,500 | 46,091 | | | | |
| Clams: | | | | | | | | |
| Hard, public | | | | | | | 57,100 | 6,063 |
| Hard, private | | | | | | | 73,500 | 11,132 |
| Surf | | | | | | | 613,900 | 18,984 |
| Oysters, market: | | | | | | | | |
| Public, spring | | | | | | | 3,200 | 360 |
| Public, fall | | | | | | | 3,200 | 360 |
| Private, spring | | | | | | | 1,884,900 | 251,167 |
| Private, fall | | | | | | | 2,332,500 | 320,845 |
| Scallops, sea | | | | | | | 234,000 | 13,650 |
| Total | 1,377,000 | 73,409 | 253,500 | 47,778 | 20,500 | 2,410 | 5,454,600 | 630,805 |

## *Fisheries of New Jersey, 1937*—Continued

### CATCH: BY GEAR—Continued

| Species | Tongs |  | Rakes |  | Hoes |  | By hand |  |
|---|---|---|---|---|---|---|---|---|
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs, hard |  |  | 186, 500 | $2, 322 |  |  |  |  |
| Clams: |  |  |  |  |  |  |  |  |
| Hard, public | 570, 200 | $95, 941 | 1, 201, 000 | 219, 791 |  |  | 383, 200 | $61, 480 |
| Hard, private | 121, 700 | 18, 530 | 66, 200 | 10, 037 |  |  | 50, 300 | 7, 798 |
| Soft, public |  |  |  |  | 1, 177, 700 | $68, 646 |  |  |
| Oysters, market: |  |  |  |  |  |  |  |  |
| Public, spring | 44, 000 | 10, 345 | 5, 800 | 730 |  |  |  |  |
| Public, fall | 134, 300 | 12, 248 | 5, 800 | 731 |  |  |  |  |
| Private, spring | 17, 700 | 3, 730 | 30, 600 | 7, 523 |  |  | 2, 200 | 508 |
| Private, fall | 64, 400 | 14, 715 | 31, 200 | 7, 664 |  |  | 2, 900 | 666 |
| Terrapin, diamond-back |  |  |  |  |  |  | 700 | 261 |
| Total | 952, 300 | 155, 509 | 1, 527, 100 | 248, 798 | 1, 177, 700 | 68, 646 | 439, 300 | 70, 713 |

### OPERATING UNITS: BY COUNTIES

| Item | Atlantic | Bergen | Burlington | Camden | Cape May | Cumberland | Gloucester |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 61 | 3 | 9 |  | 352 | 406 |  |
| On boats and shore: |  |  |  |  |  |  |  |
| Regular | 224 | 15 | 20 |  | 130 | 23 |  |
| Casual | 198 | 104 | 44 | 18 | 248 | 187 | 18 |
| Total | 483 | 122 | 73 | 18 | 730 | 616 | 18 |
| Vessels, motor: |  |  |  |  |  |  |  |
| 5 to 10 tons | 2 |  |  |  | 30 | 7 |  |
| 11 to 20 tons | 11 | 1 | 2 |  | 21 | 36 |  |
| 21 to 30 tons | 2 |  |  |  | 4 | 15 |  |
| 31 to 40 tons | 1 |  |  |  | 5 | 4 |  |
| 41 to 50 tons |  |  |  |  | 2 |  |  |
| 51 to 60 tons |  |  |  |  | 1 | 5 |  |
| 71 to 80 tons |  |  |  |  | 1 |  |  |
| Total | 16 | 1 | 2 |  | 64 | 67 |  |
| Net tonnage | 233 | 15 | 22 |  | 1, 001 | 1, 374 |  |
| Boats: |  |  |  |  |  |  |  |
| Motor | 159 | 1 | 28 |  | 151 | 45 | 2 |
| Other | 249 | 59 | 20 | 9 | 214 | 153 | 12 |
| Accessory boats | 9 |  |  |  | 39 |  |  |
| Apparatus: |  |  |  |  |  |  |  |
| Purse seines: |  |  |  |  |  |  |  |
| Other than menhaden | 1 |  |  |  | 7 |  |  |
| Length, yards | 360 |  |  |  | 2, 430 |  |  |
| Haul seines | 27 |  | 7 | 9 | 8 | 14 | 2 |
| Length, yards | 1, 884 |  | 544 | 700 | 407 | 1, 344 | 185 |
| Gill nets: |  |  |  |  |  |  |  |
| Drift | 2 |  | 8 |  | 383 | 38 | 1 |
| Square yards | 480 |  | 9, 600 |  | 176, 768 | 28, 469 | 3, 600 |
| Stake | 75 | 57 |  |  |  | 114 |  |
| Square yards | 24, 780 | 81, 791 |  |  |  | 19, 188 |  |
| Lines: |  |  |  |  |  |  |  |
| Hand | 10 |  |  |  | 270 | 5 |  |
| Hooks | 19 |  |  |  | 670 | 6 |  |
| Trawl | 153 |  |  |  | 287 | 4 |  |
| Hooks | 118, 400 |  |  |  | 190, 800 | 1, 800 |  |
| Troll | 12 |  |  |  | 299 |  |  |
| Hooks | 12 |  |  |  | 299 |  |  |
| Trot with baits or snoods |  |  |  |  | 2 | 15 |  |
| Baits or snoods |  |  |  |  | 6 | 13, 100 |  |
| Trot with hooks |  |  |  |  |  | 1 |  |
| Hooks |  |  |  |  |  | 150 |  |
| Pound nets | 2 |  |  |  | 88 |  |  |
| Weirs |  |  |  |  | 62 | 29 |  |
| Stop nets |  |  | 9 | 2 |  | 11 | 7 |
| Square yards |  |  | 10, 325 | 3, 400 |  | 13, 267 | 19, 000 |
| Fyke nets | 1 |  | 74 |  | 17 | 161 | 119 |
| Dip nets | 4 |  |  |  | 3 |  |  |
| Cast nets |  |  |  |  |  |  | 2 |
| Drop nets |  |  |  |  | 40 |  |  |
| Push nets | 2 |  |  |  |  |  |  |
| Otter trawls | 14 |  |  |  | 44 |  |  |
| Yards at mouth | 320 |  |  |  | 1, 008 |  |  |

*Fisheries of New Jersey, 1937*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Atlantic | Bergen | Burlington | Camden | Cape May | Cumberland | Gloucester |
|---|---|---|---|---|---|---|---|
| Apparatus—Continued | | | | | | | |
| Pots: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Eel | 12 | 137 | 35 | -------- | 95 | 40 | -------- |
| Fish | 900 | -------- | -------- | -------- | 2, 170 | -------- | -------- |
| Spears | -------- | -------- | -------- | -------- | 3 | -------- | -------- |
| Dredges: | | | | | | | |
| Clam | 4 | -------- | -------- | -------- | 14 | 8 | -------- |
| Yards at mouth | 3 | -------- | -------- | -------- | 12 | 9 | -------- |
| Crab | -------- | 10 | -------- | -------- | -------- | -------- | -------- |
| Yards at mouth | -------- | 10 | -------- | -------- | -------- | -------- | -------- |
| Oyster | 16 | -------- | 10 | -------- | -------- | 134 | -------- |
| Yards at mouth | 16 | -------- | 12 | -------- | -------- | 168 | -------- |
| Scallops | 2 | -------- | -------- | -------- | 4 | -------- | -------- |
| Yards at mouth | 7 | -------- | -------- | -------- | 13 | -------- | -------- |
| Tongs: | | | | | | | |
| Oyster | 31 | -------- | 8 | -------- | 5 | 132 | -------- |
| Other | 200 | -------- | 28 | -------- | 133 | -------- | -------- |
| Rakes: | | | | | | | |
| Oyster | 14 | -------- | 3 | -------- | 2 | -------- | -------- |
| Other | 210 | -------- | 7 | -------- | 116 | -------- | -------- |
| Hoes | 15 | -------- | -------- | -------- | -------- | -------- | -------- |

| Item | Hudson | Hunterdon | Mercer | Middlesex | Monmouth | Ocean | Salem |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 2 | -------- | -------- | 2 | 160 | 137 | -------- |
| On boats and shore: | | | | | | | |
| Regular | -------- | -------- | -------- | 8 | 280 | 269 | 23 |
| Casual | 9 | 32 | 20 | 6 | 280 | 363 | 54 |
| Total | 11 | 32 | 20 | 16 | 720 | 769 | 77 |
| Vessels: | | | | | | | |
| Motor: | | | | | | | |
| 5 to 10 tons | 1 | -------- | -------- | 1 | 5 | 22 | -------- |
| 11 to 20 tons | -------- | -------- | -------- | -------- | 2 | -------- | -------- |
| 31 to 40 tons | -------- | -------- | -------- | -------- | 5 | -------- | -------- |
| 141 to 150 tons | -------- | -------- | -------- | -------- | 1 | -------- | -------- |
| Total | 1 | -------- | -------- | 1 | 13 | 22 | -------- |
| Net tonnage | 9 | -------- | -------- | 8 | 399 | 136 | -------- |
| Sail: | | | | | | | |
| 5 to 10 tons | -------- | -------- | -------- | -------- | 2 | -------- | -------- |
| 11 to 20 tons | -------- | -------- | -------- | -------- | 1 | -------- | -------- |
| Total | -------- | -------- | -------- | -------- | 3 | -------- | -------- |
| Net tonnage | -------- | -------- | -------- | -------- | 32 | -------- | -------- |
| Total vessels | 1 | -------- | -------- | 1 | 16 | 22 | -------- |
| Total net tonnage | 9 | -------- | -------- | 8 | 431 | 136 | -------- |
| Boats: | | | | | | | |
| Motor | 1 | -------- | -------- | 7 | 240 | 310 | 27 |
| Other | 2 | 6 | 5 | 6 | 333 | 227 | 22 |
| Accessory boats | -------- | -------- | -------- | -------- | 22 | 1 | -------- |
| Apparatus: | | | | | | | |
| Purse seines, menhaden | -------- | -------- | -------- | -------- | 6 | -------- | -------- |
| Length, yards | -------- | -------- | -------- | -------- | 1, 680 | -------- | -------- |
| Haul seines | -------- | 6 | 2 | -------- | 4 | 27 | 15 |
| Length, yards | -------- | 1, 150 | 470 | -------- | 78 | 1, 165 | 1, 646 |
| Gill nets: | | | | | | | |
| Anchor | -------- | -------- | -------- | 3 | 3 | -------- | -------- |
| Square yards | -------- | -------- | -------- | 2, 500 | 6, 840 | -------- | -------- |
| Drift | -------- | -------- | 1 | -------- | 215 | 9 | 21 |
| Square yards | -------- | -------- | 875 | -------- | 113, 730 | 7, 200 | 130, 100 |
| Runaround | -------- | -------- | -------- | 6 | 29 | 17 | -------- |
| Square yards | -------- | -------- | -------- | 16, 470 | 105, 420 | 67, 700 | -------- |
| Stake | 9 | -------- | -------- | 8 | 30 | 254 | 32 |
| Square yards | 9, 639 | -------- | -------- | 1, 600 | 51, 985 | 27, 392 | 2, 800 |
| Lines: | | | | | | | |
| Hand | -------- | -------- | -------- | -------- | 114 | 45 | -------- |
| Hooks | -------- | -------- | -------- | -------- | 135 | 55 | -------- |
| Trawl | -------- | -------- | -------- | -------- | 27 | 95 | -------- |
| Hooks | -------- | -------- | -------- | -------- | 14, 000 | 48, 000 | -------- |

## *Fisheries of New Jersey, 1937*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Hudson | Hunterdon | Mercer | Middlesex | Monmouth | Ocean | Salem |
|---|---|---|---|---|---|---|---|
| Apparatus—Continued. | | | | | | | |
| Lines—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Troll | | | | | 104 | 67 | |
| Hooks | | | | | 104 | 67 | |
| Trot with baits or snoods | | | | | | | 4 |
| Baits or snoods | | | | | | | 1,700 |
| Pound nets | | | | | 48 | 53 | |
| Stop nets | | | | | | | 30 |
| Square yards | | | | | | | 17,325 |
| Fyke nets | | | | | 34 | 297 | 109 |
| Dip nets | | | | | 14 | 7 | |
| Cast nets | | | | | | | 1 |
| Drag nets | | | | | | 12 | |
| Yards at mouth | | | | | | 24 | |
| Push nets | | | | | | 11 | |
| Otter trawls | 1 | | | | 1 | | |
| Yards at mouth | 27 | | | | 12 | | |
| Wire baskets | | | | | | 25 | |
| Pots: | | | | | | | |
| Crab | | | | | | | 10 |
| Eel | 10 | | | 170 | 576 | 401 | |
| Fish | | | | | | 6,977 | |
| Lobster | | | | 100 | 9,599 | | |
| Spears | | | | | 37 | | |
| Dredges: | | | | | | | |
| Clam | | | | 4 | 33 | 9 | |
| Yards at mouth | | | | 5 | 33 | 12 | |
| Crab | | | | 2 | 46 | | |
| Yards at mouth | | | | 4 | 70 | | |
| Oyster | | | | | 2 | 14 | |
| Yards at mouth | | | | | 3 | 15 | |
| Tongs: | | | | | | | |
| Oyster | | | | | 2 | 9 | |
| Other | | | | | 1 | 210 | |
| Rakes: | | | | | | | |
| Oyster | | | | | 12 | 3 | |
| Other | | | | 6 | 367 | 165 | |
| Hoes | | | | | 57 | 29 | |

### CATCH: BY COUNTIES

| Species | Atlantic | | Bergen | | Burlington | | Camden | | Cape May | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 100 | $1 | | | 2,600 | $26 | | | 500 | $5 |
| Bluefish | 12,500 | 702 | | | | | | | 597,500 | 41,164 |
| Bonito | 1,200 | 54 | | | | | | | 35,700 | 1,620 |
| Butterfish | 38,600 | 1,471 | | | | | | | 1,276,900 | 53,449 |
| Carp | | | | | 33,800 | 2,390 | 35,600 | $2,492 | | |
| Catfish and bullheads | 11,300 | 397 | | | 4,200 | 184 | | | | |
| Cero | 51,100 | 1,272 | | | | | | | | |
| Cod | 575,200 | 15,993 | | | | | | | 1,188,200 | 33,818 |
| Croaker | 159,700 | 2,525 | | | | | | | 2,315,700 | 37,583 |
| Drum: | | | | | | | | | | |
| Black | | | | | | | | | 2,300 | 23 |
| Red or redfish | | | | | | | | | 7,700 | 146 |
| Eels: | | | | | | | | | | |
| Common | 49,100 | 2,511 | 23,100 | $1,878 | 500 | 35 | | | 37,900 | 6,260 |
| Conger | 3,200 | 57 | | | | | | | 25,900 | 438 |
| Flounders: | | | | | | | | | | |
| Gray sole | | | | | | | | | 3,100 | 83 |
| Yellowtail and dab | | | | | | | | | 8,900 | 169 |
| Blackback | | | | | 500 | 15 | | | 7,600 | 412 |
| Fluke | 371,500 | 31,181 | | | | | | | 1,607,900 | 127,092 |
| Frigate mackerel | | | | | | | | | 39,700 | 546 |
| Grayfish | | | | | | | | | 6,700 | 34 |
| Groupers | | | | | | | | | 21,500 | 978 |
| Hake | 3,200 | 66 | | | | | | | 43,200 | 1,291 |
| Herring, sea | 2,000 | 20 | | | | | | | 23,000 | 237 |
| Hickory shad | 100 | 1 | | | | | | | 1,300 | 19 |
| Kingfish or "king mackerel" | | | | | | | | | 149,500 | 5,677 |
| King whiting or "kingfish" | 3,600 | 194 | | | | | | | 36,000 | 938 |
| Mackerel | | | | | | | | | 236,400 | 15,252 |
| Menhaden | 5,000 | 12 | | | | | | | 10,766,000 | 35,832 |

## *Fisheries of New Jersey, 1937*—Continued

### CATCH: BY COUNTIES—Continued

| Species | Atlantic | | Bergen | | Burlington | | Camden | | Cape May | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Mullet | 200 | $2 | | | | | | | | |
| Pigfish | | | | | | | | | 100 | $2 |
| Pollock | | | | | | | | | 400 | 10 |
| Scup or porgy | 59, 300 | 1, 454 | | | | | | | 2, 754, 100 | 40, 794 |
| Sea bass | 109, 100 | 6, 676 | | | | | | | 974, 700 | 66, 781 |
| Sea robin | | | | | | | | | 16, 500 | 208 |
| Shad | 142, 100 | 22, 789 | 860, 100 | $69,565 | 6, 400 | $1, 612 | 10, 900 | $1, 515 | 3, 800 | 343 |
| Sharks | | | | | | | | | 3, 200 | 44 |
| Skates | | | | | | | | | 12, 000 | 86 |
| Snapper, red | | | | | | | | | 53, 900 | 3, 794 |
| Spanish mackerel | 100 | 5 | | | | | | | 6, 200 | 398 |
| Spot | 1, 000 | 30 | | | | | | | 11, 100 | 223 |
| Squeteagues or "sea-trout," gray | 422, 900 | 6, 907 | | | | | | | 4, 996, 000 | 103, 676 |
| Squirrel hake | 100 | 1 | | | | | | | 1, 500 | 25 |
| Striped bass | 110, 400 | 14, 843 | | | 16, 000 | 1, 920 | | | 12, 800 | 1, 412 |
| Sturgeon | 200 | 24 | | | | | | | 3, 600 | 395 |
| Suckers | | | | | 1, 700 | 133 | 2, 400 | 192 | | |
| Tautog | 2, 700 | 56 | | | | | | | 5, 000 | 85 |
| Thimble-eyed mackerel | | | | | | | | | 100 | 1 |
| Tilefish | | | | | | | | | 300 | 15 |
| Tuna | | | | | | | | | 600 | 30 |
| White perch | 32, 500 | 3, 226 | | | 8, 000 | 1, 040 | | | 10, 000 | 1, 200 |
| Whiting | 20, 800 | 277 | | | | | | | 523, 100 | 8, 656 |
| Crabs: | | | | | | | | | | |
| Hard | 2, 300 | 154 | 5, 000 | 200 | | | | | 4, 700 | 484 |
| King | | | | | | | | | 2, 460, 700 | 6, 464 |
| Soft and peelers | 200 | 75 | | | | | | | 900 | 406 |
| Lobsters | 18, 300 | 4, 177 | | | | | | | 6, 700 | 828 |
| Shrimp | 2, 200 | 550 | | | | | | | | |
| Clams: | | | | | | | | | | |
| Hard, public | 355, 900 | 54, 281 | | | 17, 900 | 2, 348 | | | 405, 300 | 81, 594 |
| Hard, private | 25, 900 | 4, 290 | | | 22, 400 | 3, 211 | | | 700 | 278 |
| Soft, public | 516, 400 | 32, 007 | | | | | | | | |
| Surf | 85, 100 | 3, 275 | | | | | | | 496, 100 | 13, 869 |
| Oysters, market: | | | | | | | | | | |
| Public, spring | 38, 500 | 9, 145 | | | | | | | 1, 300 | 425 |
| Public, fall | | | | | | | | | 1, 200 | 400 |
| Private, spring | 44, 700 | 10, 740 | | | 82, 000 | 19, 538 | | | 18, 000 | 4, 453 |
| Private, fall | 91, 800 | 21, 805 | | | 82, 000 | 19, 537 | | | 18, 900 | 4, 671 |
| Scallops, sea | 54, 000 | 3, 150 | | | | | | | 180, 000 | 10, 500 |
| Squid | 10, 100 | 324 | | | | | | | 579, 100 | 10, 519 |
| Turtles, loggerhead | | | | | | | | | 700 | 11 |
| Total | 3, 434, 200 | 256, 720 | 888, 200 | 71, 643 | 278, 000 | 51, 989 | 48, 900 | 4, 199 | 32, 002, 400 | 726, 146 |

| Species | Cumberland | | Gloucester | | Hudson | | Hunterdon | | Mercer | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 9, 800 | $98 | | | | | | | 14, 000 | $175 |
| Carp | 62, 800 | 3, 959 | 30, 000 | $2, 100 | | | 2, 700 | $216 | 500 | 30 |
| Catfish and bullheads | 16, 700 | 610 | 12, 000 | 435 | | | | | | |
| Cod | 9, 100 | 230 | | | | | | | | |
| Croaker | 71, 500 | 830 | | | | | | | | |
| Eels, common | 14, 500 | 1, 360 | 1, 300 | 150 | 2, 600 | $180 | | | | |
| Flounders, blackback | | | | | 24, 000 | 720 | | | | |
| Shad | 49, 800 | 12, 603 | 900 | 300 | 37, 200 | 3, 475 | 22, 000 | 4, 075 | 6, 500 | 900 |
| Spot | 500 | 10 | | | | | | | | |
| Squeteagues or "sea trout," gray | 112, 600 | 3, 217 | | | | | | | | |
| Striped bass | 10, 200 | 1, 336 | | | | | | | | |
| Suckers | | | 600 | 48 | | | 7, 100 | 426 | 9, 000 | 270 |
| White perch | 8, 500 | 722 | | | | | | | | |
| Crabs: | | | | | | | | | | |
| Hard | 123, 300 | 4, 929 | | | | | | | | |
| King | 288, 000 | 678 | | | | | | | | |
| Clams, hard, private | 27, 700 | 3, 290 | | | | | | | | |
| Oysters, market: | | | | | | | | | | |
| Public, fall | 128, 900 | 11, 073 | | | | | | | | |
| Private, spring | 1, 761, 400 | 220, 962 | | | | | | | | |
| Private, fall | 2, 204, 200 | 289, 640 | | | | | | | | |
| Terrapin, diamond-back | 700 | 261 | | | | | | | | |
| Turtles, snapper | 8, 200 | 511 | | | | | | | | |
| Total | 4, 908, 400 | 556, 319 | 44, 800 | 3, 033 | 63, 800 | 4, 375 | 31, 800 | 4, 717 | 30, 000 | 1, 375 |

*Fisheries of New Jersey, 1937*—Continued

CATCH: BY COUNTIES—Continued

| Species | Middlesex | | Monmouth | | Ocean | | Salem | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 212,100 | $2,121 | 179,600 | $1,752 | 4,400 | $44 |
| Bluefish | 48,200 | $3,827 | 482,200 | 33,936 | 343,900 | 21,994 | | |
| Bonito | | | 57,200 | 2,612 | 80,300 | 3,156 | | |
| Butterfish | | | 355,600 | 15,304 | 1,384,600 | 46,651 | | |
| Carp | | | | | | | 158,500 | 11,637 |
| Catfish and bullheads | | | | | | | 16,000 | 820 |
| Cod | | | 90,900 | 2,337 | 701,500 | 15,437 | | |
| Croaker | | | 265,800 | 3,353 | 1,121,600 | 23,152 | | |
| Drum: | | | | | | | | |
| Black | | | 200 | 4 | 2,600 | 46 | | |
| Red or redfish | | | 100 | 4 | 2,300 | 50 | | |
| Eels: | | | | | | | | |
| Common | 2,600 | 216 | 109,800 | 11,253 | 20,500 | 1,594 | 10,500 | 870 |
| Conger | | | 800 | 8 | 1,100 | 17 | | |
| Flounders: | | | | | | | | |
| Gray sole | | | | | 2,000 | 80 | | |
| Yellowtail and dab | | | 100 | 6 | 4,800 | 192 | | |
| Blackback | | | 13,100 | 434 | 89,300 | 3,496 | | |
| Fluke | | | 68,700 | 6,002 | 104,100 | 7,632 | | |
| Frigate mackerel | | | 40,400 | 484 | 78,100 | 895 | | |
| Grayfish | | | 50,900 | 509 | | | | |
| Hake | | | 500 | 10 | 2,600 | 70 | | |
| Herring, sea | | | 143,900 | 1,317 | 197,000 | 1,926 | | |
| Hickory shad | | | 600 | 12 | | | | |
| King whiting or "kingfish" | | | 17,300 | 990 | 21,400 | 926 | | |
| Mackerel | 600 | 28 | 674,700 | 21,180 | 757,400 | 22,933 | | |
| Menhaden | | | 56,764,000 | 227,575 | 221,000 | 896 | | |
| Mullet | | | 300 | 12 | | | | |
| Pollock | | | 700 | 19 | 400 | 16 | | |
| Pompano | | | 100 | 35 | | | | |
| Rudderfish | | | 2,100 | 21 | | | | |
| Scup or porgy | | | 1,144,800 | 21,395 | 1,086,600 | 21,075 | | |
| Sea bass | | | 64,200 | 4,221 | 963,300 | 38,156 | | |
| Sea robin | | | 10,100 | 101 | 28,800 | 288 | | |
| Shad | 12,500 | 1,472 | 1,561,400 | 141,880 | 476,700 | 51,723 | 149,200 | 10,478 |
| Sharks | | | 9,800 | 154 | 30,700 | 492 | | |
| Skates | | | 23,000 | 229 | 22,700 | 122 | | |
| Spanish mackerel | | | 19,100 | 2,024 | 24,900 | 1,773 | | |
| Spot | | | 1,400 | 28 | 800 | 19 | | |
| Squeteagues or "sea trout", gray | 76,000 | 3,605 | 1,737,800 | 56,946 | 3,169,900 | 116,498 | | |
| Squirrel hake | | | 37,700 | 377 | 75,900 | 759 | | |
| Striped bass | | | | | 91,000 | 12,132 | 800 | 95 |
| Sturgeon | | | 500 | 76 | | | 2,000 | 150 |
| Suckers | | | | | | | 300 | 21 |
| Swellfish | | | 100 | 1 | | | | |
| Tautog | | | 4,400 | 96 | 2,100 | 52 | | |
| Thimble-eyed mackerel | | | | | 15,000 | 274 | | |
| Tuna | | | 22,000 | 778 | 28,100 | 940 | | |
| White perch | | | | | 19,400 | 1,684 | 4,500 | 364 |
| Whiting | | | 3,981,300 | 39,858 | 4,098,500 | 43,018 | | |
| Yellow perch | | | | | 4,800 | 576 | 900 | 90 |
| Yellowtail | | | 700 | 14 | | | | |
| Crabs: | | | | | | | | |
| Hard | 6,000 | 170 | 273,800 | 10,025 | 198,200 | 3,067 | 22,300 | 2,875 |
| King | | | 17,800 | 79 | | | | |
| Soft and peelers | | | 40,400 | 13,325 | 13,900 | 4,700 | 4,200 | 1,575 |
| Lobsters | 100 | 25 | 224,700 | 46,098 | 19,000 | 4,950 | | |
| Shrimp | | | | | 34,900 | 8,725 | | |
| Clams: | | | | | | | | |
| Hard, public | 11,700 | 1,418 | 806,400 | 151,366 | 614,300 | 92,268 | | |
| Hard, private | | | 11,000 | 2,050 | 224,000 | 34,378 | | |
| Soft, public | | | 478,500 | 25,895 | 182,800 | 10,744 | | |
| Surf | | | 19,500 | 1,125 | 13,200 | 715 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | | | 9,000 | 1,090 | 4,200 | 775 | | |
| Public, fall | | | 9,000 | 1,091 | 4,200 | 775 | | |
| Private, spring | | | 3,500 | 700 | 25,800 | 6,535 | | |
| Private, fall | | | 3,500 | 700 | 30,600 | 7,537 | | |
| Scallops, sea | | | 100 | 9 | | | | |
| Squid | | | 114,000 | 2,693 | 442,500 | 8,850 | | |
| Turtles: | | | | | | | | |
| Hawksbill | | | 3,900 | 78 | | | | |
| Loggerhead | | | 5,400 | 105 | 600 | 6 | | |
| Total | 157,700 | 10,761 | 69,990,900 | 854,145 | 17,263,500 | 626,517 | 373,600 | 29,019 |

## *Fisheries of New Jersey, 1937*—Continued

### SEED OYSTER FISHERY: BY GEAR

| Item | Dredges | Tongs | Rakes | Total, exclusive of duplication |
|---|---|---|---|---|
| OPERATING UNITS | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* |
| On vessels | 1,158 | | | 1,158 |
| On boats and shore: | | | | |
| Regular | | 81 | 2 | 83 |
| Casual | | 117 | 3 | 120 |
| Total | 1,158 | 198 | 5 | 1,361 |
| Vessels: | | | | |
| Motor | 2 | | | 2 |
| Net tonnage | 23 | | | 23 |
| Sail | 103 | | | 103 |
| Net tonnage | 2,371 | | | 2,371 |
| Total vessels | 105 | | | 105 |
| Total net tonnage | 2,394 | | | 2,394 |
| Boats: | | | | |
| Motor | | 71 | 4 | 75 |
| Other | | 120 | 1 | 121 |
| Apparatus: | | | | |
| Number | 210 | 198 | 5 | |
| Yards at mouth | 260 | | | |

| Item | Dredges | | Tongs | | Rakes | | Total, exclusive of duplication | |
|---|---|---|---|---|---|---|---|---|
| CATCH | | | | | | | | |
| Oysters, seed: | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* |
| Public, spring | 991,500 | $385,680 | 68,660 | $17,978 | 850 | $212 | 1,061,010 | $403,870 |
| Public, fall | | | 10,990 | 2,842 | 550 | 138 | 11,540 | 2,980 |
| Total | 991,500 | 385,680 | 79,650 | 20,820 | 1,400 | 350 | 1,072,550 | 406,850 |

### SEED OYSTER FISHERY: BY COUNTIES

| Item | Atlantic | Burlington | Cape May | Cumberland | Ocean |
|---|---|---|---|---|---|
| OPERATING UNITS | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | 1,158 | |
| On boats and shore: | | | | | |
| Regular | 36 | 20 | 2 | 22 | 3 |
| Casual | 7 | 3 | | 110 | |
| Total | 43 | 23 | 2 | 1,290 | 3 |
| Vessels: | | | | | |
| Motor | | | | 2 | |
| Net tonnage | | | | 23 | |
| Sail | | | | 103 | |
| Net tonnage | | | | 2,371 | |
| Total vessels | | | | 105 | |
| Total net tonnage | | | | 2,394 | |
| Boats: | | | | | |
| Motor | 39 | 9 | 2 | 24 | 1 |
| Other | 3 | 13 | | 103 | 2 |
| Apparatus: | | | | | |
| Dredges | | | | 210 | |
| Yards at mouth | | | | 260 | |
| Tongs | 42 | 19 | 2 | 132 | 3 |
| Rakes | 1 | 4 | | | |

| Item | Atlantic | | Burlington | | Cape May | | Cumberland | | Ocean | |
|---|---|---|---|---|---|---|---|---|---|---|
| CATCH | | | | | | | | | | |
| Oysters, seed: | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* |
| Public, spring | 6,710 | $2,507 | 10,300 | $2,558 | 1,000 | $250 | 1,033,000 | $396,055 | 10,000 | $2,500 |
| Public, fall | 1,240 | 421 | 10,300 | 2,559 | | | | | | |
| Total | 7,950 | 2,928 | 20,600 | 5,117 | 1,000 | 250 | 1,033,000 | 396,055 | 10,000 | 2,500 |

NOTE.—Of the total number of persons fishing for seed oysters, 1,348 are duplicated among those fishing for market oysters or other species. Similarly the following craft and gear are duplicated: 56 sailing vessels, 1 motor vessel, 72 motorboats, 120 other boats, 116 dredges, 193 tongs, and 4 rakes.

## PENNSYLVANIA

### *Fisheries of Pennsylvania, 1937* [1]

OPERATING UNITS: BY GEAR

| Item | Haul seines |
|---|---|
| | *Number* |
| Fishermen, on boats and shore, casual | 34 |
| Boats, other than motor | 8 |
| Apparatus: | |
| Number | 8 |
| Length, yards | 1,650 |

CATCH: BY GEAR

| Species | Haul seines | |
|---|---|---|
| | *Pounds* | *Value* |
| Carp | 3,500 | $210 |
| Shad | 12,600 | 3,522 |
| Suckers | 18,600 | 900 |
| Total | 34,700 | 4,632 |

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[1] The commercial fisheries of Pennsylvania are confined to Bucks County.

## DELAWARE

### *Fisheries of Delaware, 1937*

OPERATING UNITS: BY GEAR

| Item | Purse seines, menhaden | Haul seines | Gill nets | | | Lines | |
|---|---|---|---|---|---|---|---|
| | | | Drift | Run-around | Stake | Hand | Trawl |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 295 | | | | | | |
| On boats and shore: | | | | | | | |
| Regular | | 4 | | 9 | 2 | | |
| Casual | | 185 | 38 | 11 | 24 | 8 | 2 |
| Total | 295 | 189 | 38 | 20 | 26 | 8 | 2 |
| Vessels, steam: | | | | | | | |
| 61 to 70 tons | 1 | | | | | | |
| 81 to 90 tons | 1 | | | | | | |
| 91 to 100 tons | 1 | | | | | | |
| 111 to 120 tons | 1 | | | | | | |
| 121 to 130 tons | 1 | | | | | | |
| 141 to 150 tons | 1 | | | | | | |
| 161 to 170 tons | 2 | | | | | | |
| 181 to 190 tons | 1 | | | | | | |
| Total | 9 | | | | | | |
| Net tonnage | 1,167 | | | | | | |
| Boats: | | | | | | | |
| Motor | | | 9 | 6 | 1 | 2 | 1 |
| Other | | 47 | 10 | 6 | 13 | 2 | |
| Accessory boats | 27 | | | | | | |
| Apparatus: | | | | | | | |
| Number | 9 | 47 | 26 | 10 | 27 | 8 | 1 |
| Length, yards | 4,335 | 11,715 | | | | | |
| Square yards | | | 51,925 | 8,210 | 14,180 | | |
| Hooks, baits, or snoods | | | | | | 16 | 3,000 |

## *Fisheries of Delaware, 1937*—Continued

### OPERATING UNITS: By gear—Continued

| Item | Pound nets | Stop nets | Fyke nets | Dip nets | Cast nets | Pots | |
|---|---|---|---|---|---|---|---|
| | | | | | | Eel | Lobster |
| Fishermen: | | | | | | | |
| On boats and shore: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Regular | | | | 22 | | | |
| Casual | 6 | 7 | 28 | 45 | 1 | 17 | 6 |
| Total | 6 | 7 | 28 | 67 | 1 | 17 | 6 |
| Boats: | | | | | | | |
| Motor | | | 3 | 5 | | 3 | 3 |
| Other | 4 | 4 | 12 | 51 | 1 | 7 | |
| Apparatus: | | | | | | | |
| Number | 17 | 11 | 233 | 67 | 1 | 340 | 115 |
| Square yards | | 1,580 | | | | | |

| Item | Dredges | | | Tongs, other than for oysters | By hand, other than for oysters | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| | Clam | Crab | Oyster | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 14 | 10 | 35 | | | 337 |
| On boats and shore: | | | | | | |
| Regular | | | | | | 25 |
| Casual | 2 | 2 | | 3 | 27 | 330 |
| Total | 16 | 12 | 35 | 3 | 27 | 692 |
| Vessels: | | | | | | |
| Steam: | | | | | | |
| 61 to 70 tons | | | | | | 1 |
| 81 to 90 tons | | | | | | 1 |
| 91 to 100 tons | | | | | | 1 |
| 111 to 120 tons | | | | | | 1 |
| 121 to 130 tons | | | | | | 1 |
| 141 to 150 tons | | | | | | 1 |
| 161 to 170 tons | | | | | | 2 |
| 181 to 190 tons | | | | | | 1 |
| Total | | | | | | 9 |
| Net tonnage | | | | | | 1,167 |
| Motor: | | | | | | |
| 11 to 20 tons | 3 | 2 | 3 | | | 5 |
| 21 to 30 tons | 1 | 1 | 2 | | | 2 |
| Total | 4 | 3 | 5 | | | 7 |
| Net tonnage | 80 | 59 | 105 | | | 138 |
| Total vessels | 4 | 3 | 5 | | | 16 |
| Total net tonnage | 80 | 59 | 105 | | | 1,305 |
| Boats: | | | | | | |
| Motor | 1 | 1 | | | | 22 |
| Other | | | | 3 | | 128 |
| Accessory boats | | | | | | 27 |
| Apparatus: | | | | | | |
| Number | 10 | 8 | 10 | 3 | | |
| Yards at mouth | 12 | 10 | 14 | | | |

## *Fisheries of Delaware, 1937*—Continued

### CATCH: By gear

| Species | Purse seines | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Drift | | Runaround | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 64, 600 | $1, 298 | 2, 800 | $54 | | |
| Bluefish | | | 1, 900 | 133 | 3, 600 | 252 | | |
| Carp | | | 25, 400 | 2, 032 | | | | |
| Catfish and bullheads | | | 12, 100 | 368 | | | | |
| Croaker | | | 171, 400 | 1, 714 | 56, 800 | 852 | 28, 800 | $432 |
| Flounders | | | | | | | 200 | 10 |
| Menhaden | 48, 857, 000 | $227, 831 | | | | | | |
| Mullet | | | 1, 300 | 52 | 1, 000 | 40 | 62, 100 | 2, 490 |
| Shad | | | 2, 600 | 467 | 13, 800 | 2, 085 | | |
| Spot | | | | | 3, 000 | 150 | | |
| Squeteagues or "sea trout," gray | | | 256, 000 | 7, 680 | 25, 100 | 753 | 2, 400 | 72 |
| Striped bass | | | 15, 100 | 1, 604 | | | 1, 500 | 180 |
| Sturgeon | | | | | 400 | 74 | | |
| White perch | | | 12, 100 | 1, 209 | | | 200 | 20 |
| Yellow perch | | | 200 | 8 | | | | |
| Total | 48, 857, 000 | 227, 831 | 562, 700 | 16, 565 | 106, 500 | 4, 260 | 95, 200 | 3, 204 |

| Species | Gill nets—Contd. | | Lines | | | | Pound nets | |
|---|---|---|---|---|---|---|---|---|
| | Stake | | Hand | | Trawl | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | | | 2, 500 | $50 |
| Carp | 9, 600 | $768 | | | | | 100 | 8 |
| Catfish and bullheads | | | | | | | 1, 300 | 39 |
| Cod | | | | | 48, 000 | $1, 680 | | |
| Croaker | | | 14, 000 | $210 | | | | |
| Eels, common | | | | | | | 500 | 65 |
| Flounders | 200 | 10 | | | | | | |
| Gizzard shad | | | | | | | 500 | 10 |
| Shad | 4, 100 | 695 | | | | | | |
| Squeteagues or "sea trout," gray | | | 7, 000 | 210 | | | | |
| Striped bass | 10, 700 | 1, 284 | | | | | | |
| Tautog | | | 1, 100 | 33 | | | | |
| White perch | 1, 000 | 100 | | | | | 1, 900 | 184 |
| Yellow perch | | | | | | | 1, 800 | 84 |
| Total | 25, 600 | 2, 857 | 22, 100 | 453 | 48, 000 | 1, 680 | 8, 600 | 440 |

| Species | Stop nets | | Fyke nets | | Dip nets | | Cast nets | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Carp | 9, 400 | $752 | | | | | 300 | $24 |
| Catfish and bullheads | | | 17, 400 | $520 | | | | |
| Croaker | | | 800 | 8 | | | | |
| Eels, common | | | 16, 300 | 2, 394 | | | | |
| Flounders | | | 3, 800 | 194 | | | | |
| Squeteagues or "sea trout," gray | | | 1, 600 | 48 | | | | |
| Striped bass | | | 4, 500 | 480 | | | | |
| White perch | | | 3, 800 | 380 | | | | |
| Yellow perch | | | 4, 200 | 210 | | | | |
| Crabs: | | | | | | | | |
| Hard | | | 800 | 16 | 180, 000 | $2, 705 | | |
| Soft and peelers | | | | | 78, 500 | 14, 894 | | |
| Turtles, snapper | | | 3, 100 | 246 | | | | |
| Total | 9, 400 | 752 | 56, 300 | 4, 496 | 258, 500 | 17, 599 | 300 | 24 |

*Fisheries of Delaware, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Pots |  |  |  | Dredges |  | Tongs |  | By hand |  |
|---|---|---|---|---|---|---|---|---|---|---|
|  | Eel |  | Lobster |  |  |  |  |  |  |  |
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels, common | 16,800 | $2,469 |  |  |  |  |  |  |  |  |
| Crabs: |  |  |  |  |  |  |  |  |  |  |
| Hard |  |  |  |  | 83,600 | $1,987 |  |  |  |  |
| King |  |  |  |  |  |  |  |  | 489,000 | $854 |
| Lobsters |  |  | 4,300 | $1,290 |  |  |  |  |  |  |
| Clams: |  |  |  |  |  |  |  |  |  |  |
| Hard, public |  |  |  |  | 7,600 | 920 |  |  |  |  |
| Hard, private |  |  |  |  | 16,000 | 2,330 |  |  |  |  |
| Mussels, sea |  |  |  |  |  |  | 2,800 | $173 |  |  |
| Oysters, market, private, fall |  |  |  |  | 270,200 | 29,170 |  |  |  |  |
| Total | 16,800 | 2,469 | 4,300 | 1,290 | 377,400 | 34,407 | 2,800 | 173 | 489,000 | 854 |

OPERATING UNITS: BY COUNTIES

| Item | Kent | New Castle | Sussex |
|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* |
| On vessels | 42 |  | 295 |
| On boats and shore: |  |  |  |
| Regular |  |  | 25 |
| Casual | 104 | 34 | 192 |
| Total | 146 | 34 | 512 |
| Vessels: |  |  |  |
| Steam: |  |  |  |
| 61 to 70 tons |  |  | 1 |
| 81 to 90 tons |  |  | 1 |
| 91 to 100 tons |  |  | 1 |
| 111 to 120 tons |  |  | 1 |
| 121 to 130 tons |  |  | 1 |
| 141 to 150 tons |  |  | 1 |
| 161 to 170 tons |  |  | 2 |
| 181 to 190 tons |  |  | 1 |
| Total |  |  | 9 |
| Net tonnage |  |  | 1,167 |
| Motor: |  |  |  |
| 11 to 20 tons | 5 |  |  |
| 21 to 30 tons | 2 |  |  |
| Total | 7 |  |  |
| Net tonnage | 138 |  |  |
| Total vessels | 7 |  | 9 |
| Total net tonnage | 138 |  | 1,167 |
| Boats: |  |  |  |
| Motor | 3 | 4 | 15 |
| Other | 20 | 14 | 94 |
| Accessory boats |  |  | 27 |
| Apparatus: |  |  |  |
| Purse seines, menhaden |  |  | 9 |
| Length, yards |  |  | 4,335 |
| Haul seines | 16 | 8 | 23 |
| Length, yards | 3,365 | 995 | 7,355 |
| Gill nets: |  |  |  |
| Drift |  | 7 | 19 |
| Square yards |  | 33,850 | 18,075 |
| Runaround |  |  | 10 |
| Square yards |  |  | 8,210 |
| Stake | 8 | 2 | 17 |
| Square yards | 9,360 | 600 | 4,220 |
| Lines: |  |  |  |
| Hand |  |  | 8 |
| Hooks |  |  | 16 |
| Trawl |  |  | 1 |
| Hooks |  |  | 3,000 |

## *Fisheries of Delaware, 1937*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Kent | New Castle | Sussex |
|---|---|---|---|
| Apparatus—Continued | *Number* | *Number* | *Number* |
| Pound nets |  | 6 | 11 |
| Stop nets | 5 | 6 |  |
| Square yards | 740 | 840 |  |
| Fyke nets | 5 | 141 | 87 |
| Dip nets |  |  | 67 |
| Cast nets | 1 |  |  |
| Pots: |  |  |  |
| Eel | 90 | 36 | 214 |
| Lobster |  |  | 115 |
| Dredges: |  |  |  |
| Clam | 10 |  |  |
| Yards at mouth | 12 |  |  |
| Crab | 8 |  |  |
| Yards at mouth | 10 |  |  |
| Oyster | 10 |  |  |
| Yards at mouth | 14 |  |  |
| Tongs, other than for oysters | 3 |  |  |

### CATCH: BY COUNTIES

| Species | Kent |  | New Castle |  | Sussex |  |
|---|---|---|---|---|---|---|
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives |  |  | 2,800 | $54 | 67,100 | $1,348 |
| Bluefish | 100 | $7 |  |  | 5,400 | 378 |
| Carp | 14,800 | 1,184 | 30,000 | 2,400 |  |  |
| Catfish and bullheads | 2,000 | 60 | 28,300 | 847 | 500 | 20 |
| Cod |  |  |  |  | 48,000 | 1,680 |
| Croaker | 53,400 | 534 |  |  | 218,400 | 2,682 |
| Eels, common | 3,400 | 542 | 8,500 | 1,277 | 21,700 | 3,109 |
| Flounders |  |  |  |  | 4,200 | 214 |
| Gizzard shad |  |  | 500 | 10 |  |  |
| Menhaden |  |  |  |  | 48,857,000 | 227,831 |
| Mullet |  |  |  |  | 64,400 | 2,582 |
| Shad | 5,600 | 983 | 11,700 | 1,749 | 3,200 | 515 |
| Spot |  |  |  |  | 3,000 | 150 |
| Squeteagues or "sea trout," gray | 113,500 | 3,405 |  |  | 178,600 | 5,358 |
| Striped bass | 4,900 | 490 |  |  | 26,900 | 3,058 |
| Sturgeon |  |  | 400 | 74 |  |  |
| Tautog |  |  |  |  | 1,100 | 33 |
| White perch | 4,600 | 460 | 700 | 63 | 13,700 | 1,370 |
| Yellow perch |  |  | 800 | 32 | 5,400 | 270 |
| Crabs: |  |  |  |  |  |  |
| Hard | 83,600 | 1,987 | 800 | 16 | 180,000 | 2,705 |
| Soft and peeler |  |  |  |  | 78,500 | 14,894 |
| King | 489,000 | 854 |  |  |  |  |
| Lobsters |  |  |  |  | 4,300 | 1,290 |
| Clams: |  |  |  |  |  |  |
| Hard, public | 7,600 | 920 |  |  |  |  |
| Hard, private | 16,000 | 2,330 |  |  |  |  |
| Mussels, sea | 2,800 | 173 |  |  |  |  |
| Oysters, market, private, fall | 270,200 | 29,170 |  |  |  |  |
| Turtles, snapper |  |  | 3,100 | 246 |  |  |
| Total | 1,071,500 | 43,099 | 87,600 | 6,768 | 49,781,400 | 269,487 |

### SEED OYSTER FISHERY: BY GEAR

| Item | Dredges |  |
|---|---|---|
| OPERATING UNITS | *Number* |  |
| Fishermen, on vessels | 40 |  |
| Vessels, sail | 5 |  |
| Net tonnage | 89 |  |
| Apparatus: |  |  |
| Number | 10 |  |
| Yards at mouth | 12 |  |
| CATCH | *Bushels* | *Value* |
| Oysters, seed, public, spring | 83,600 | $13,800 |

NOTE.—The seed oyster fishery of Delaware was confined to Kent County. Of the total number of persons fishing for seed oysters 13 were duplicated among those fishing for market oysters or other species. Similarly the following craft and gear were duplicated: 2 sailing vessels and 4 dredges.

### SHAD FISHERY OF THE HUDSON RIVER

The shad fishery of the Hudson River in 1937 was prosecuted by 613 fishermen who used 299 boats, 15 haul seines, 186 drift gill nets, and 113 stake gill nets. The total commercial catch amounted to 878,190 shad, having a weight of 2,732,200 pounds and a value to the fishermen of $212,786. This is an increase of 26 percent in the number of shad and 25 percent in their value as compared with 1936. The average price per pound received by the fishermen was about 8 cents, compared with a price of about 7 cents in 1936.

Stake gill nets accounted for 65 percent of the weight of the shad taken, drift gill nets 34 percent, and haul seines 1 percent.

Statistics of the catch of shad in the Hudson River also are included in the catch data for New York and New Jersey which are published elsewhere in this report.

*Shad fishery of the Hudson River, 1937*

| Item | New York | | | New Jersey | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| Fishermen: | | | | | | | | | |
| On boats and shore: | *Number* | | | *Number* | | | *Number* | | |
| Regular | 62 | | | 24 | | | 86 | | |
| Casual | 353 | | | 174 | | | 527 | | |
| Total | 415 | | | 198 | | | 613 | | |
| Boats: | | | | | | | | | |
| Motor | ---------- | | | 17 | | | 17 | | |
| Other | 218 | | | 64 | | | 282 | | |
| Apparatus: | | | | | | | | | |
| Haul seines | 15 | | | ---------- | | | 15 | | |
| Length, yards | 2,422 | | | ---------- | | | 2,422 | | |
| Gill nets: | | | | | | | | | |
| Drift | 185 | | | 1 | | | 186 | | |
| Square yards | 595,499 | | | 2,030 | | | 597,529 | | |
| Stake | 26 | | | 87 | | | 113 | | |
| Square yards | 3,599 | | | 133,776 | | | 137,375 | | |
| Shad caught: | *Number* | *Pounds* | *Value* | *Number* | *Pounds* | *Value* | *Number* | *Pounds* | *Value* |
| With haul seines | 5,900 | 19,700 | $1,433 | ---------- | ---------- | ---------- | 5,900 | 19,700 | $1,433 |
| With drift gill nets | 279,780 | 932,600 | 70,009 | 1,000 | 3,000 | $234 | 280,780 | 935,600 | 70,243 |
| With stake gill nets | 7,110 | 23,700 | 1,749 | 584,400 | 1,753,200 | 139,361 | 591,510 | 1,776,900 | 141,110 |
| Total | 292,790 | 976,000 | 73,191 | 585,400 | 1,756,200 | 139,595 | 878,190 | 2,732,200 | 212,786 |

## FISHERIES OF THE CHESAPEAKE BAY STATES

(Area XXIII) [7]

The yield of the commercial fisheries of the Chesapeake Bay States (Maryland and Virginia) during 1937 amounted to 292,244,400 pounds, valued at $6,361,234 to the fishermen, representing a decrease of 7 percent in volume and 2 percent in value as compared with the catch in the previous year. These fisheries gave employment to 16,529 fishermen, as compared with 18,283 in 1936.

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[7] This is the number given to this area by the North American Council on Fishery Investigations. It should be explained that there may be included under this area, craft whose principal fishing ports are in the area but at times fish elsewhere. Data on the operating units and catch of the fisheries of the Chesapeake Bay States have been taken largely from statistics collected by the State fishery agencies of Maryland and Virginia. Supplementary surveys, compilations, and analyses, have been made by agents of this Bureau in order that the figures may be presented in a manner comparable with those of other sections. It should be observed that the persons engaged, gear and craft employed, and the catch of the seed oyster fishery are not included among the statistics of the fishery for market oysters and other species but are shown in separate tables in this section. For a clearer understanding of the statistics published in this section, the reader is referred to the section in the latter part of this document entitled "Statistical survey procedure."

There were 561 fishery wholesale and manufacturing establishments in the two States in 1937, as compared with 585 in 1936. In 1937 these establishments employed 12,005 persons, paid $3,068,069 in salaries and wages, and produced manufactured products (canned, cured, packaged, and byproducts) valued at $10,009,939. In 1936 the wholesale and manufacturing firms employed 12,663 persons, paid $3,073,443 in salaries and wages, and produced manufactured products valued at $9,813,684.

*Fisheries of the Chesapeake Bay States, 1937*

SUMMARY OF CATCH

| Product | Maryland | | Virginia | | Total | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Fish | 10, 365, 000 | $392, 995 | 199, 118, 300 | $1, 982, 849 | 209, 483, 300 | $2, 375, 844 |
| Shellfish, etc | 39, 587, 600 | 2, 139, 034 | 43, 173, 500 | 1, 846, 356 | 82, 761, 100 | 3, 985, 390 |
| Total | 49, 952, 600 | 2, 532, 029 | 242, 291, 800 | 3, 829, 205 | 292, 244, 400 | 6, 361, 234 |

OPERATING UNITS: BY STATES

| Item | Maryland | Virginia | Total |
|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* |
| On vessels | 820 | 1, 666 | 2, 486 |
| On boats and shore: | | | |
| Regular | 4, 278 | 4, 851 | 9, 129 |
| Casual | 1, 844 | 3, 070 | 4, 914 |
| Total | 6, 942 | 9, 587 | 16, 529 |
| Vessels: | | | |
| Steam | | 25 | 25 |
| Net tonnage | | 2, 833 | 2, 833 |
| Motor | 32 | 139 | 171 |
| Net tonnage | 202 | 2, 469 | 2, 671 |
| Sail | 151 | | 151 |
| Net tonnage | 1, 886 | | 1, 886 |
| Total vessels | 183 | 164 | 347 |
| Total net tonnage | 2, 088 | 5, 302 | 7, 390 |
| Boats: | | | |
| Motor | 2, 743 | 3, 366 | 6, 109 |
| Other | 1, 688 | 3, 004 | 4, 692 |
| Accessory boats | | 105 | 105 |
| Apparatus: | | | |
| Purse seines, menhaden | | 36 | 36 |
| Length, yards | | 11, 050 | 11, 050 |
| Haul seines | 132 | 139 | 271 |
| Length, yards | 24, 402 | 53, 876 | 78, 278 |
| Gill nets: | | | |
| Anchor | 417 | 3 | 420 |
| Square yards | 58, 794 | 3, 600 | 62, 394 |
| Drift | 235 | 223 | 458 |
| Square yards | 199, 248 | 201, 605 | 400, 853 |
| Stake | 3, 001 | 5, 963 | 8, 964 |
| Square yards | 251, 435 | 135, 732 | 387, 167 |
| Lines: | | | |
| Hand | 100 | 93 | 193 |
| Hooks | 120 | 161 | 281 |
| Trot with baits or snoods | 1, 586 | 1, 962 | 3, 548 |
| Baits or snoods | 1, 005, 750 | 1, 023, 610 | 2, 029, 360 |
| Trot with hooks | 3 | 5 | 8 |
| Hooks | 300 | 2, 550 | 2, 850 |
| Pound nets | 455 | 1, 656 | 2, 111 |
| Crab pound nets | | 277 | 277 |
| Stop nets | | 2 | 2 |
| Square yards | | 1, 300 | 1, 300 |
| Fyke nets | 1, 834 | 762 | 2, 596 |
| Dip nets | 863 | 1, 440 | 2, 303 |
| Otter trawls | | 19 | 19 |
| Yards at mouth | | 515 | 515 |
| Slat traps | | 4 | 4 |

## *Fisheries of the Chesapeake Bay States, 1937*—Continued

### OPERATING UNITS: BY STATES—Continued

| Item | Maryland | Virginia | Total |
|---|---|---|---|
| Apparatus—Continued. | | | |
| Pots: | *Number* | *Number* | *Number* |
| Crab | ---------- | 1, 060 | 1, 060 |
| Eel | 10, 596 | 677 | 11, 273 |
| Fish | 10 | 221 | 231 |
| Scrapes | 632 | 114 | 746 |
| Yards at mouth | 632 | 117 | 749 |
| Dredges: | | | |
| Crab | ---------- | 198 | 198 |
| Yards at mouth | ---------- | 382 | 382 |
| Oyster | 406 | 53 | 459 |
| Yards at mouth | 478 | 84 | 562 |
| Scallop | ---------- | 2 | 2 |
| Yards at mouth | ---------- | 6 | 6 |
| Tongs: | | | |
| Oyster | 4, 252 | 2, 877 | 7, 129 |
| Other | 77 | 353 | 430 |
| Rakes, oyster | 29 | 515 | 544 |
| Picks | ---------- | 375 | 375 |

### CATCH: BY STATES

| Species | Maryland | | Virginia | | Total | |
|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 3, 819, 100 | $39, 578 | 15, 064, 300 | $147, 871 | 18, 883, 400 | $187, 449 |
| Black bass | 41, 400 | 4, 909 | ---------- | ---------- | 41, 400 | 4, 909 |
| Bluefish | 80, 900 | 6, 709 | 528, 500 | 23, 187 | 609, 400 | 29, 896 |
| Bonito | 16, 500 | 775 | 18, 200 | 732 | 34, 700 | 1, 507 |
| Butterfish | 91, 500 | 4, 322 | 1, 956, 400 | 28, 699 | 2, 047, 900 | 33, 021 |
| Cabio or crab eater | ---------- | ---------- | 20, 100 | 715 | 20, 100 | 715 |
| Carp | 239, 500 | 14, 207 | 393, 700 | 8, 027 | 633, 200 | 22, 234 |
| Catfish and bullheads | 500, 400 | 14, 555 | 607, 100 | 21, 468 | 1, 107, 500 | 36, 023 |
| Cod | ---------- | ---------- | 900 | 17 | 900 | 17 |
| Crappie | 2, 700 | 172 | ---------- | ---------- | 2, 700 | 172 |
| Croaker | 982, 900 | 18, 171 | 33, 111, 700 | 498, 163 | 34, 094, 600 | 516, 334 |
| Drum: | | | | | | |
| Black | 30, 800 | 358 | 16, 600 | 190 | 47, 400 | 548 |
| Red or redfish | 2, 200 | 49 | 43, 300 | 768 | 45, 500 | 817 |
| Eels: | | | | | | |
| Common | 191, 300 | 16, 068 | 125, 500 | 11, 184 | 316, 800 | 27, 252 |
| Conger | 400 | 8 | 400 | 7 | 800 | 15 |
| Flounders | 30, 000 | 1, 729 | 500, 000 | 25, 893 | 530, 000 | 27, 622 |
| Gizzard shad | 112, 800 | 1, 782 | 238, 600 | 2, 571 | 351, 400 | 4, 353 |
| Grayfish | ---------- | ---------- | 5, 400 | 170 | 5, 400 | 170 |
| Hake | 2, 500 | 40 | 500 | 10 | 3, 000 | 50 |
| Harvestfish or "starfish" | 2, 800 | 76 | 1, 090, 500 | 19. 802 | 1, 093, 300 | 19, 878 |
| Hickory shad | 28, 200 | 637 | 84, 600 | 1, 746 | 112, 800 | 2, 383 |
| Hogchoker | 17, 700 | 471 | ---------- | ---------- | 17, 700 | 471 |
| Hogfish | ---------- | ---------- | 600 | 18 | 600 | 18 |
| King whiting or "kingfish" | 7, 300 | 401 | 135, 800 | 4, 194 | 143, 100 | 4, 595 |
| Mackerel | 2, 000 | 120 | 100, 700 | 2, 031 | 102, 700 | 2, 151 |
| Menhaden | 15, 000 | 170 | 121, 965, 000 | 484, 904 | 121, 980, 000 | 485, 074 |
| Mullet | 2, 900 | 131 | 11, 400 | 282 | 14, 300 | 413 |
| Pike or pickerel | 39, 900 | 6, 377 | 300 | 30 | 40, 200 | 6, 407 |
| Pompano | ---------- | ---------- | 11, 100 | 988 | 11, 100 | 988 |
| Scup | 26, 000 | 590 | 1, 931, 400 | 31, 008 | 1, 957. 400 | 31, 598 |
| Sea bass | 15, 100 | 904 | 197, 500 | 8, 586 | 212, 600 | 9, 490 |
| Sea robin | ---------- | ---------- | 2, 800 | 44 | 2, 800 | 44 |
| Shad | 404, 800 | 39, 538 | 3, 085, 800 | 273, 073 | 3, 490, 600 | 312, 611 |
| Sharks | ---------- | ---------- | 6, 200 | 207 | 6, 200 | 207 |
| Sheepshead | ---------- | ---------- | 100 | 2 | 100 | 2 |
| Skates | ---------- | ---------- | 16, 400 | 161 | 16, 400 | 161 |
| Snapper, red | ---------- | ---------- | 100 | 4 | 100 | 4 |
| Spanish mackerel | 33, 800 | 2, 378 | 805. 500 | 18, 007 | 839, 300 | 20, 385 |
| Spot | 27, 600 | 1, 172 | 2, 978, 500 | 54, 659 | 3, 006, 100 | 55, 831 |
| Squeteagues or "sea trout": | | | | | | |
| Gray | 1, 089, 800 | 34, 587 | 12, 606, 700 | 233, 242 | 13, 696, 500 | 267, 829 |
| Spotted | 7, 400 | 526 | 140, 600 | 7, 042 | 148, 000 | 7, 568 |
| Striped bass | 2, 011, 300 | 156, 809 | 1, 004, 500 | 62, 757 | 3, 015, 800 | 219, 566 |
| Sturgeon | ---------- | ---------- | 12, 700 | 1, 355 | 12, 700 | 1, 355 |
| Suckers | 2. 800 | 143 | 300 | 6 | 3, 100 | 149 |
| Sunfish | 1, 500 | 49 | ---------- | ---------- | 1, 500 | 49 |
| Swellfish | ---------- | ---------- | 8, 400 | 117 | 8, 400 | 117 |
| Tautog | 200 | 10 | 300 | 11 | 500 | 21 |
| Tomcod | ---------- | ---------- | 100 | 1 | 100 | 1 |
| Tuna | 100 | 8 | ---------- | ---------- | 100 | 8 |

## *Fisheries of the Chesapeake Bay States, 1937*—Continued

CATCH: BY STATES—Continued

| Species | Maryland | | Virginia | | Total | |
|---|---|---|---|---|---|---|
| FISH—continued | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| White perch | 296, 700 | $12, 668 | 195, 400 | $5, 183 | 492, 100 | $17, 851 |
| Whiting | | | 17, 200 | 194 | 17, 200 | 194 |
| Yellow perch | 187, 200 | 11, 798 | 76, 600 | 3, 523 | 263, 800 | 15, 321 |
| Total | 10, 365, 000 | 392, 995 | 199, 118, 300 | 1, 982, 849 | 209, 483, 300 | 2, 375, 844 |
| SHELLFISH, ETC. | | | | | | |
| Crabs: | | | | | | |
| Hard | 16, 198, 300 | 393, 304 | 27, 927, 500 | 565, 052 | 44, 125, 800 | 958, 356 |
| Soft and peelers | 2, 514, 100 | 211, 196 | 2, 475, 300 | 224, 915 | 4, 989, 400 | 436, 111 |
| Shrimp | | | 1, 700 | 120 | 1, 700 | 120 |
| Clams: [1] | | | | | | |
| Hard, public | 64, 000 | 12, 000 | 1, 624, 100 | 269, 032 | 1, 688, 100 | 281, 032 |
| Hard, private | | | 7, 000 | 1, 750 | 7, 000 | 1, 750 |
| Mussels, sea | | | 27, 700 | 788 | 27, 700 | 788 |
| Oysters, market: [2] | | | | | | |
| Public, spring | 6, 223, 200 | 406, 089 | 1, 284, 600 | 88, 460 | 7, 509, 800 | 494, 549 |
| Public, fall | 12, 936, 000 | 903, 568 | 2, 104, 800 | 144, 570 | 15, 040, 800 | 1, 048, 138 |
| Private, spring | 585, 100 | 90, 393 | 2, 347, 800 | 169, 730 | 2, 932, 900 | 260, 123 |
| Private, fall | 985, 400 | 119, 424 | 5, 248, 800 | 378, 390 | 6, 234, 200 | 497, 814 |
| Scallops, sea [3] | | | 10, 800 | 1, 426 | 10, 800 | 1, 426 |
| Squid | 73, 000 | 1, 120 | 111, 900 | 2, 101 | 184, 900 | 3, 221 |
| Terrapin, diamond-back | 3, 500 | 1, 590 | | | 3, 500 | 1, 590 |
| Turtles, snapper | 5, 000 | 350 | 1, 500 | 22 | 6, 500 | 372 |
| Total | 39, 587, 600 | 2, 139, 034 | 43, 173, 500 | 1, 846, 356 | 82, 761, 100 | 3, 985, 390 |
| Grand total | 49, 952, 600 | 2, 532, 029 | 242, 291, 800 | 3, 829, 205 | 292, 244, 400 | 6, 361, 234 |

[1] Statistics on hard clams used in this table are based on yields of 8 pounds of meats per bushel for clams from public beds and 7 pounds for those from private beds.

[2] Statistics on market oysters used in this table are based on yields of 5.98 pounds of meats per bushel in Maryland, and 6.06 pounds in Virginia.

[3] The sea scallops were taken by a Virginia vessel operating off the New England and Middle Atlantic States.

NOTE.—The seed oyster fishery was prosecuted in this section only in Virginia where 1,220 fishermen using 13 motor vessels, 433 motorboats, 33 other boats, and 910 tongs took 794,100 bushels of seed oysters, valued at $198,485 from public beds and 2,400 bushels, valued at $600, from private beds. Of the total number of persons fishing for seed oysters, 815 are duplicated among those fishing for market oysters or other species. Similarly, the following craft and gear are duplicated: 295 motorboats, 21 other boats, and 606 tongs.

### SUPPLEMENTARY TABLE SHOWING THE PRODUCTION OF CERTAIN SHELLFISH IN NUMBER AND BUSHELS

| Product | Maryland | | Virginia | | Total | |
|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Crabs: | | | | | | |
| Hard ..... number | 48, 594, 900 | $393, 304 | 83, 782, 500 | $565, 052 | 132, 377, 400 | $958, 356 |
| Soft and peelers ..... do | 10, 056, 400 | 211, 196 | 9, 901, 200 | 224, 915 | 19, 957, 600 | 436, 111 |
| Clams: | | | | | | |
| Hard, public ..... bushels | 8, 000 | 12, 000 | 203, 012 | 269, 032 | 211, 012 | 281, 032 |
| Hard, private ..... do | | | 1, 000 | 1, 750 | 1, 000 | 1, 750 |
| Mussels, sea ..... do | | | 2, 308 | 788 | 2, 308 | 788 |
| Oysters, market: | | | | | | |
| Public, spring ..... do | 1, 040, 669 | 406, 089 | 211, 980 | 88, 460 | 1, 252, 649 | 494, 549 |
| Public, fall ..... do | 2, 163, 211 | 903, 568 | 347, 327 | 144, 570 | 2, 510, 538 | 1, 048, 138 |
| Private, spring ..... do | 97, 843 | 90, 393 | 387, 426 | 169, 730 | 485, 269 | 260, 123 |
| Private, fall ..... do | 164, 783 | 119, 424 | 866, 139 | 378, 390 | 1, 030, 922 | 497, 814 |
| Scallops, sea ..... do | | | 2, 700 | 1, 426 | 2, 700 | 1, 426 |

## *Industries Related to the Fisheries of the Chesapeake Bay States, 1937*

### OPERATING UNITS, SALARIES, AND WAGES

| Item | Maryland | Virginia | Total |
|---|---|---|---|
| Transporting: | *Number* | *Number* | *Number* |
| Persons engaged | 315 | 881 | 1,196 |
| Vessels: | | | |
| Steam | ------ | 1 | 1 |
| Net tonnage | ------ | 83 | 83 |
| Motor | 159 | 441 | 600 |
| Net tonnage | 2,102 | 4,251 | 6,353 |
| Sail | 1 | ------ | 1 |
| Net tonnage | 21 | ------ | 21 |
| Total vessels | 160 | 442 | 602 |
| Total net tonnage | 2,123 | 4,334 | 6,457 |
| Wholesale and manufacturing: | | | |
| Establishments | 319 | 242 | 561 |
| Persons engaged: | | | |
| Proprietors | 437 | 281 | 718 |
| Salaried employees | 212 | 173 | 385 |
| Wage earners: | | | |
| Average for season | 6,266 | 4,636 | 10,902 |
| Average for year | 2,837 | 1,808 | 4,645 |
| Paid to salaried employees | $226,966 | $271,771 | $498,737 |
| Paid to wage earners | $1,635,704 | $933,628 | $2,569,332 |
| Total salaries and wages | $1,862,670 | $1,205,399 | $3,068,069 |
| Fishermen manufacturing | 80 | ------ | 80 |

### PRODUCTS MANUFACTURED

| Item | Maryland | | Virginia | |
|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments: | | | | |
| Alewives: | | | | |
| Salted: | | | | |
| Corned ... pounds | (1) | (1) | 1,943,634 | $30,337 |
| Pickled [2] ... do | 2,471,575 | $70,701 | ------ | ------ |
| Tight-pack cut ... do | (1) | (1) | 1,597,150 | 53,787 |
| Canned ... standard cases | 35,511 | 84,527 | 19,482 | 55,058 |
| Roe, canned ... do | 15,030 | 86,535 | 23,230 | 131,202 |
| Dry scrap ... tons | (1) | (1) | 465 | 20,347 |
| Oil ... gallons | (1) | (1) | 5,200 | 1,556 |
| Croaker: | | | | |
| Fresh fillets ... pounds | ------ | ------ | 95,800 | 11,770 |
| Fresh pan-dressed ... do | ------ | ------ | 107,000 | 9,490 |
| Flounders, fresh fillets ... do | ------ | ------ | 54,200 | 8,136 |
| Menhaden products: | | | | |
| Dry scrap ... tons | ------ | ------ | 14,091 | 606,841 |
| Oil ... gallons | ------ | ------ | 1,361,181 | 522,476 |
| Sea bass: | | | | |
| Fresh fillets ... pounds | ------ | ------ | 104,800 | 17,270 |
| Fresh pan-dressed ... do | ------ | ------ | 60,000 | 6,600 |
| Scup: | | | | |
| Fresh fillets ... do | ------ | ------ | 24,400 | 3,690 |
| Fresh pan-dressed ... do | ------ | ------ | 28,000 | 2,620 |
| Squeteagues: | | | | |
| Fresh fillets ... do | ------ | ------ | 163,400 | 22,910 |
| Fresh pan-dressed ... do | ------ | ------ | 310,000 | 23,000 |
| Crabs, blue, meat packaged, fresh-cooked ... do | 2,617,704 | 896,475 | 1,637,254 | 579,199 |
| Clams, hard, chowder, canned ... standard cases | 37,613 | 84,681 | ------ | ------ |
| Oysters, fresh-shucked ... gallons | 2,630,334 | 2,937,625 | 1,376,628 | 1,596,231 |
| Oyster-shell products: | | | | |
| Poultry feed ... tons | 37,621 | 171,855 | 19,377 | 113,395 |
| Lime ... do | 29,180 | 52,190 | 18,343 | 112,082 |
| Lime, "burned" ... do | ------ | ------ | 13,098 | 89,119 |

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[1] The production of this item is included under "Unclassified products."

[2] This item is usually an intermediate product and although included in the total may be shown in its final stage of processing in this or another State.

*Industries Related to the Fisheries of the Chesapeake Bay States, 1937*—Continued

PRODUCTS MANUFACTURED—Continued

| Item | Maryland | | Virginia | |
|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments—Continued. | | | | |
| Unclassified products: | | | | |
| Packaged, fresh fillets and pan-dressed ......pounds.. | | | [3] 150,000 | [3] $10,830 |
| Acid and dry scrap, and meal ......tons.. | [4] 805 | [4] $17,857 | [5] 2,437 | [5] 58,310 |
| Canned ......standard cases.. | [6] 25,147 | [6] 161,655 | (7) | (7) |
| Smoked and salted ......pounds.. | [8] 730,750 | [8] 171,738 | (7) | (7) |
| Miscellaneous | | [9] 1,178,150 | | [10] 9,694 |
| Total | | 5,913,989 | | 4,095,950 |
| By fishermen: | | | | |
| Alewives, salted ......pounds.. | 188,025 | 7,087 | | |
| Eels: | | | | |
| Salted ......do.... | 76,550 | 6,482 | | |
| Smoked ......do.... | 600 | 176 | | |
| Hogchokers, salted ......do.... | 9,075 | 475 | | |
| Total | 274,250 | 14,220 | | |
| Grand total | | 5,928,209 | | 4,095,950 |

[3] Includes fresh fillets of sea robin; fresh pan-dressed flounders and whiting; and frozen fillets of croaker.

[4] Includes alewife and blue crab dry scrap.

[5] Includes blue crab and miscellaneous dry scrap; menhaden, starfish and miscellaneous fish meals; and alewife and menhaden acid scrap.

[6] Includes canned oysters, fish paste, fish cakes, and oyster, shrimp, and terrapin soup.

[7] The production of this item is included under "Miscellaneous."

[8] Includes smoked butterfish, carp, chub, cisco, tullibees, eels, sea herring, salmon, shad, sturgeon, lake trout, and whitefish; corned alewives and tight-pack cut alewives.

[9] Includes marine-shell buttons and novelties; canned cat and dog food; and alewife oil.

[10] Includes fresh-shucked hard clams, tight-pack alewife roe, miscellaneous fish oil, and canned blue crabs.

NOTE.—The total value of manufactured products in the Chesapeake Bay States was as follows: By manufacturing establishments, $10,009,939, and by fishermen, $14,220. Some of the above products may have been imported from another State or a foreign country; therefore, they cannot be correlated directly with the catch within the State. Of the total number of persons engaged on transporting vessels, 1,047 have been included as fishermen, and among the total number of persons engaged in the preparation of fishermen's prepared products all have been included as fishermen.

## MARYLAND

### *Fisheries of Maryland, 1937*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Gill nets | | | Lines | | |
|---|---|---|---|---|---|---|---|
| | | Anchor | Drift | Stake | Hand | Trot with baits or snoods | Trot with hooks |
| Fishermen: | | | | | | | |
| On boats and shore: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Regular | 233 | 37 | 56 | 118 | | 1,213 | |
| Casual | 150 | 28 | 216 | 146 | 40 | 163 | 2 |
| Total | 383 | 65 | 272 | 264 | 40 | 1,376 | 2 |
| Boats: | | | | | | | |
| Motor | 75 | 26 | 66 | 116 | 20 | 1,227 | 2 |
| Other | 107 | 16 | 102 | 78 | | 138 | 1 |
| Apparatus: | | | | | | | |
| Number | 132 | 417 | 235 | 3,001 | 100 | 1,586 | 3 |
| Length, yards | 24,402 | | | | | | |
| Square yards | | 58,794 | 199,248 | 251,435 | | | |
| Hooks, bait, or snoods | | | | | 120 | 1,005,750 | 300 |

## *Fisheries of Maryland, 1937*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Pound nets | Fyke nets | Dip nets | Pots | | Scrapes |
|---|---|---|---|---|---|---|
| | | | | Eel | Fish | |
| Fishermen: | | | | | | |
| On boats and shore: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Regular | 303 | 56 | 542 | 122 | | 296 |
| Casual | 122 | 101 | 321 | 39 | 1 | |
| Total | 425 | 157 | 863 | 161 | 1 | 296 |
| Boats: | | | | | | |
| Motor | 139 | 61 | 99 | 88 | | |
| Other | 112 | 69 | 764 | 32 | 1 | 296 |
| Apparatus: | | | | | | |
| Number | 455 | 1,834 | 863 | 10,596 | 10 | 632 |
| Yards at mouth | | | | | | 623 |

| Item | Dredges, oyster | Tongs | | Rakes, other than for oysters | By hand, other than for oysters | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| | | Oyster | Other | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 758 | 62 | | | | 820 |
| On boats and shore: | | | | | | |
| Regular | 97 | 3,486 | 66 | 29 | 57 | 4,278 |
| Casual | | 704 | 11 | | 1 | 1,844 |
| Total | 855 | 4,252 | 77 | 29 | 58 | 6,942 |
| Vessels: | | | | | | |
| Motor: | | | | | | |
| 5 to 10 tons | 1 | 30 | | | | 31 |
| 11 to 20 tons | | 1 | | | | 1 |
| Total | 1 | 31 | | | | 32 |
| Net tonnage | 7 | 195 | | | | 202 |
| Sail: | | | | | | |
| 5 to 10 tons | 101 | | | | | 101 |
| 11 to 20 tons | 25 | | | | | 25 |
| 21 to 30 tons | 16 | | | | | 16 |
| 31 to 40 tons | 5 | | | | | 5 |
| 41 to 50 tons | 2 | | | | | 2 |
| 51 to 60 tons | 2 | | | | | 2 |
| Total | 151 | | | | | 151 |
| Net tonnage | 1,886 | | | | | 1,886 |
| Total vessels | 152 | 31 | | | | 183 |
| Total net tonnage | 1,893 | 195 | | | | 2,088 |
| Boats: | | | | | | |
| Motor | 39 | 2,006 | 24 | 5 | | 2,743 |
| Other | 36 | 142 | 52 | 15 | 30 | 1,688 |
| Apparatus: | | | | | | |
| Number | 406 | 4,252 | 77 | 29 | | |
| Yards at mouth | 478 | | | | | |

CATCH: BY GEAR

| Species | Haul seines | | Gill nets | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Anchor | | Drift | | Stake | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 84,900 | $903 | 1,700 | $55 | 16,700 | $456 | 60,100 | $1,119 |
| Black bass | 23,500 | 2,576 | | | | | 100 | 7 |
| Bluefish | 3,600 | 294 | | | 6,200 | 610 | 900 | 72 |
| Butterfish | 400 | 40 | | | | | 200 | 14 |
| Carp | 203,000 | 12,421 | | | 2,600 | 125 | 5,400 | 204 |
| Catfish and bullheads | 164,600 | 4,080 | 300 | 9 | 3,200 | 83 | 1,500 | 54 |
| Crappie | 200 | 8 | | | | | 100 | 4 |
| Croaker | 376,700 | 6,629 | | | | | 5,100 | 169 |
| Eels, common | 1,300 | 123 | | | | | | |

## *Fisheries of Maryland, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Haul seines | | Gill nets | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Anchor | | Drift | | Stake | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders | 1,000 | $40 | | | | | | |
| Gizzard shad | 19,200 | 269 | | | 2,000 | $20 | 1,400 | $24 |
| Hickory shad | 700 | 24 | | | 400 | 17 | 1,600 | 38 |
| Menhaden | 3,000 | 50 | | | | | | |
| Mullet | 800 | 47 | | | | | 2,000 | 80 |
| Pike or pickerel | 11,100 | 2,190 | 100 | $15 | | | 1,500 | 273 |
| Scup | | | | | | | 9,000 | 360 |
| Shad | 2,900 | 305 | 2,100 | 165 | 70,600 | 7,866 | 31,600 | 3,568 |
| Spanish mackerel | 1,000 | 79 | | | | | | |
| Spot | 9,200 | 459 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 34,600 | 1,658 | 100 | 10 | | | 1,200 | 86 |
| Spotted | 4,200 | 285 | | | | | | |
| Striped bass | 443,900 | 33,801 | 54,400 | 4,582 | 296,500 | 24,847 | 351,500 | 27,942 |
| Suckers | 600 | 20 | | | | | 100 | 3 |
| Sunfish | 1,000 | 29 | | | | | | |
| Tuna | | | | | | | 100 | 8 |
| White perch | 48,300 | 2,191 | 1,500 | 75 | 5,200 | 248 | 11,900 | 677 |
| Yellow perch | 26,300 | 1,340 | 400 | 39 | | | 1,600 | 123 |
| Crabs, soft and peelers | 62,300 | 6,298 | | | | | | |
| Total | 1,528,300 | 76,159 | 60,600 | 4,950 | 403,400 | 34,272 | 486,900 | 34,825 |

| Species | Lines | | | | | | Pound nets | |
|---|---|---|---|---|---|---|---|---|
| | Hand | | Trot with baits or snoods | | Trot with hooks | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | | | 3,638,400 | $36,843 |
| Black bass | | | | | | | 1,200 | 129 |
| Bluefish | 50,000 | $4,000 | | | | | 20,200 | 1,733 |
| Bonito | 4,000 | 200 | | | | | 12,500 | 575 |
| Butterfish | | | | | | | 90,900 | 4,268 |
| Carp | | | | | | | 9,400 | 392 |
| Catfish and bullheads | | | | | 1,800 | $66 | 70,700 | 2,220 |
| Crappie | | | | | | | 300 | 19 |
| Croaker | | | | | | | 600,100 | 11,353 |
| Drum: | | | | | | | | |
| Black | | | | | | | 30,800 | 358 |
| Red or redfish | | | | | | | 2,200 | 49 |
| Eels: | | | | | | | | |
| Common | | | | | 100 | 9 | 6,100 | 462 |
| Conger | 400 | 8 | | | | | | |
| Flounders | | | | | | | 27,300 | 1,557 |
| Gizzard shad | | | | | | | 85,100 | 1,289 |
| Hake | | | | | | | 2,500 | 40 |
| Harvestfish or "starfish" | | | | | | | 2,800 | 76 |
| Hickory shad | | | | | | | 25,500 | 558 |
| Hogchoker | | | | | | | 17,700 | 471 |
| King whiting or "kingfish" | | | | | | | 7,300 | 401 |
| Mackerel | | | | | | | 2,000 | 120 |
| Menhaden | | | | | | | 12,000 | 120 |
| Pike or pickerel | | | | | | | 1,500 | 208 |
| Scup | 5,000 | 50 | | | | | 12,000 | 180 |
| Sea bass | 15,000 | 900 | | | | | 100 | 4 |
| Shad | | | | | | | 295,000 | 27,294 |
| Spanish Mackerel | | | | | | | 32,800 | 2,299 |
| Spot | | | | | | | 18,400 | 713 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 6,000 | 480 | | | | | 1,047,300 | 32,311 |
| Spotted | | | | | | | 3,200 | 241 |
| Striped bass | | | | | | | 857,000 | 64,890 |
| Sunfish | | | | | | | 500 | 20 |
| Tautog | 200 | 10 | | | | | | |
| White perch | | | | | | | 141,600 | 5,568 |
| Yellow perch | | | | | | | 11,000 | 741 |
| Crabs: | | | | | | | | |
| Hard | | | 16,050,800 | $389,617 | | | | |
| Soft and peelers | | | 262,900 | 21,891 | | | | |
| Squid | | | | | | | 73,000 | 1,120 |
| Total | 80,600 | 5,648 | 16,313,700 | 411,508 | 1,900 | 75 | 7,158,400 | 198,622 |

## *Fisheries of Maryland, 1937*—Continued

### CATCH: By gear—Continued

| Species | Fyke nets | | Dip nets | | Pots | | Scrapes | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 17,300 | $202 | | | | | | |
| Black bass | 16,600 | 2,197 | | | | | | |
| Carp | 19,100 | 1,065 | | | | | | |
| Catfish and bullheads | 257,100 | 7,983 | | | 1,200 | $60 | | |
| Crappie | 2,100 | 141 | | | | | | |
| Croaker | 1,000 | 20 | | | | | | |
| Eels, common | 5,100 | 440 | | | 178,700 | 15,034 | | |
| Flounders | 1,700 | 132 | | | | | | |
| Gizzard shad | 5,100 | 180 | | | | | | |
| Mullet | 100 | 4 | | | | | | |
| Pike or pickerel | 25,700 | 3,691 | | | | | | |
| Shad | | | 2,600 | $340 | | | | |
| Squeteagues or "sea trout," gray | 600 | 42 | | | | | | |
| Striped bass | 8,000 | 747 | | | | | | |
| Suckers | 2,100 | 120 | | | | | | |
| White perch | 88,200 | 3,909 | | | | | | |
| Yellow perch | 147,900 | 9,555 | | | | | | |
| Crabs: | | | | | | | | |
| Hard | | | 147,500 | 3,687 | | | | |
| Soft and peelers | | | 701,000 | 64,575 | | | 1,487,900 | $118,432 |
| Total | 597,700 | 30,428 | 851,100 | 68,602 | 179,900 | 15,094 | 1,487,900 | 118,432 |

| Species | Dredges | | Tongs | | Rakes | | By hand | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams, hard, public | | | 54,400 | $10,200 | 3,200 | $600 | 6,400 | $1,200 |
| Oysters, market: | | | | | | | | |
| Public, spring | 658,200 | $49,513 | 5,565,000 | 356,576 | | | | |
| Public, fall | 2,829,100 | 210,810 | 10,106,900 | 692,758 | | | | |
| Private, spring | 65,000 | 9,444 | 520,100 | 80,949 | | | | |
| Private, fall | 363,300 | 51,972 | 622,100 | 67,452 | | | | |
| Terrapin, diamond-back | | | | | | | 3,500 | 1,590 |
| Turtle, snapper | | | | | | | 5,000 | 350 |
| Total | 3,915,600 | 321,739 | 16,868,500 | 1,207,935 | 3,200 | 600 | 14,900 | 3,140 |

### OPERATING UNITS: By counties

| Item | Anne Arundel | Baltimore | Calvert | Caroline | Cecil | Charles | Dorchester | Harford |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 25 | 40 | 25 | | | 8 | 249 | |
| On boats and shore: | | | | | | | | |
| Regular | 566 | 7 | 325 | 3 | 22 | 117 | 629 | 5 |
| Casual | 105 | 52 | 68 | 52 | 58 | 180 | 168 | 45 |
| Total | 696 | 99 | 418 | 55 | 80 | 305 | 1,046 | 50 |
| Vessels: | | | | | | | | |
| Motor: | | | | | | | | |
| 5 to 10 tons | 9 | | 4 | | | 1 | 9 | |
| 11 to 20 tons | 1 | | | | | | | |
| Total | 10 | | 4 | | | 1 | 9 | |
| Net tonnage | 68 | | 26 | | | 7 | 56 | |
| Sail: | | | | | | | | |
| 5 to 10 tons | | | 2 | | | 1 | 38 | |
| 11 to 20 tons | 1 | 3 | 1 | | | | 5 | |
| 21 to 30 tons | | 3 | 1 | | | | 3 | |
| 31 to 40 tons | | 1 | | | | | | |
| 51 to 60 tons | | 1 | | | | | | |
| Total | 1 | 8 | 4 | | | 1 | 46 | |
| Net tonnage | 19 | 195 | 54 | | | 9 | 437 | |
| Total vessels | 11 | 8 | 8 | | | 2 | 55 | |
| Total net tonnage | 87 | 195 | 80 | | | 16 | 493 | |

*Fisheries of Maryland, 1937*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Anne Arundel | Baltimore | Calvert | Caroline | Cecil | Charles | Dorchester | Harford |
|---|---|---|---|---|---|---|---|---|
| Boats: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Motor | 277 | 20 | 169 | 14 | 32 | 102 | 474 | 14 |
| Other | 168 | 37 | 116 | 20 | 21 | 34 | 76 | 15 |
| Apparatus: | | | | | | | | |
| Haul seines | 31 | 3 | 6 | 4 | 15 | 18 | 3 | 6 |
| Length, yards | 3,160 | 400 | 1,235 | 1,689 | 3,580 | 3,373 | 1,060 | 1,780 |
| Gill nets: | | | | | | | | |
| Anchor | 3 | 4 | -------- | -------- | 80 | -------- | -------- | -------- |
| Square yards | 955 | 1,200 | -------- | -------- | 18,745 | -------- | -------- | -------- |
| Drift | 4 | -------- | -------- | 56 | 7 | 7 | 26 | 8 |
| Square yards | 2,400 | -------- | -------- | 27,836 | 12,650 | 8,065 | 22,146 | 16,500 |
| Stake | 14 | 42 | -------- | 57 | 37 | 1,071 | 145 | 137 |
| Square yards | 2,156 | 3,174 | -------- | 2,638 | 3,071 | 88,032 | 7,018 | 14,726 |
| Lines: | | | | | | | | |
| Trot with baits or snoods | 88 | 20 | 63 | -------- | -------- | 68 | 552 | -------- |
| Baits or snoods | 49,800 | 10,000 | 29,200 | -------- | -------- | 68,000 | 289,200 | -------- |
| Trot with hooks | -------- | -------- | -------- | 2 | 1 | -------- | -------- | -------- |
| Hooks | -------- | -------- | -------- | 200 | 100 | -------- | -------- | -------- |
| Pound nets | 25 | 6 | 5 | 11 | 26 | 25 | 104 | 14 |
| Fyke nets | 16 | 134 | -------- | 25 | 950 | 35 | 5 | 273 |
| Dip nets | 125 | 20 | 124 | -------- | -------- | -------- | 41 | -------- |
| Pots: | | | | | | | | |
| Eel | 432 | 435 | 24 | 15 | 1,211 | 29 | 2,247 | 271 |
| Fish | -------- | -------- | -------- | 10 | -------- | -------- | -------- | -------- |
| Dredges, oyster | 2 | 16 | 8 | -------- | -------- | 4 | 92 | -------- |
| Yards at mouth | 3 | 21 | 9 | -------- | -------- | 5 | 111 | -------- |
| Tongs, oyster | 568 | -------- | 385 | -------- | -------- | 178 | 737 | -------- |

| Item | Kent | Prince Georges | Queen Annes | St. Marys | Somerset | Talbot | Wicomico | Worcester |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 6 | -------- | 2 | 5 | 399 | 55 | 6 | -------- |
| On boats and shore: | | | | | | | | |
| Regular | 333 | 4 | 333 | 507 | 597 | 494 | 197 | 139 |
| Casual | 133 | 21 | 207 | 215 | 173 | 78 | 155 | 134 |
| Total | 472 | 25 | 542 | 727 | 1,169 | 627 | 358 | 273 |
| Vessels: | | | | | | | | |
| Motor, 5 to 10 tons | 3 | -------- | 1 | -------- | 2 | 2 | -------- | -------- |
| Net tonnage | 19 | -------- | 5 | -------- | 11 | 10 | -------- | -------- |
| Sail: | | | | | | | | |
| 5 to 10 tons | -------- | -------- | -------- | -------- | 50 | 10 | -------- | -------- |
| 11 to 20 tons | -------- | -------- | -------- | -------- | 15 | -------- | -------- | -------- |
| 21 to 30 tons | -------- | -------- | -------- | -------- | 8 | -------- | 1 | -------- |
| 31 to 40 tons | -------- | -------- | -------- | 1 | 3 | -------- | -------- | -------- |
| 41 to 50 tons | -------- | -------- | -------- | -------- | 2 | -------- | -------- | -------- |
| 51 to 60 tons | -------- | -------- | -------- | -------- | 1 | -------- | -------- | -------- |
| Total | -------- | -------- | -------- | 1 | 79 | 10 | 1 | -------- |
| Net tonnage | -------- | -------- | -------- | 32 | 1,042 | 73 | 25 | -------- |
| Total vessels | 3 | -------- | 1 | 1 | 81 | 12 | 1 | -------- |
| Total net tonnage | 19 | -------- | 5 | 32 | 1,053 | 83 | 25 | -------- |
| Boats: | | | | | | | | |
| Motor | 288 | 5 | 250 | 243 | 158 | 408 | 134 | 155 |
| Other | 50 | 12 | 38 | 243 | 619 | 70 | 49 | 120 |
| Apparatus: | | | | | | | | |
| Haul seines | 16 | 7 | 7 | 8 | 5 | 2 | 1 | -------- |
| Length, yards | 2,675 | 910 | 1,750 | 1,790 | 50 | 450 | 500 | -------- |
| Gill nets: | | | | | | | | |
| Anchor | 330 | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Square yards | 37,894 | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Drift | 22 | 2 | -------- | -------- | 10 | 15 | 58 | 20 |
| Square yards | 48,666 | 2,400 | -------- | -------- | 6,265 | 9,220 | 37,500 | 5,600 |
| Stake | 1,070 | 2 | 11 | -------- | 86 | 7 | 315 | 7 |
| Square yards | 115,030 | 82 | 1,482 | -------- | 2,044 | 470 | 10,752 | 760 |

## *Fisheries of Maryland, 1937*—Continued

### OPERATING UNITS: By counties—Continued

| Item | Kent | Prince Georges | Queen Annes | St. Marys | Somerset | Talbot | Wicomico | Worcester |
|---|---|---|---|---|---|---|---|---|
| Apparatus—Continued. | | | | | | | | |
| Lines: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Hand | | | | | | | | 100 |
| Hooks | | | | | | | | 120 |
| Trot with baits or snoods | 126 | | 76 | 137 | 134 | 202 | 5 | 115 |
| Baits or snoods | 100, 800 | | 45, 900 | 104, 400 | 92, 200 | 130, 750 | 4, 000 | 81, 500 |
| Pound nets | 26 | | 6 | 64 | 21 | 74 | 27 | 21 |
| Fyke nets | 220 | 84 | 29 | | 12 | 33 | 11 | 7 |
| Dip nets | 15 | | 32 | 158 | 309 | 31 | | 8 |
| Pots, eel | 780 | 45 | 2, 377 | 15 | 40 | 2, 660 | 15 | |
| Scrapes | | | | | 632 | | | |
| Yards at mouth | | | | | 632 | | | |
| Dredges, oyster | | | | 2 | 202 | 20 | 2 | 58 |
| Yards at mouth | | | | 3 | 254 | 27 | 3 | 42 |
| Tongs: | | | | | | | | |
| Oyster | 326 | | 499 | 571 | 223 | 459 | 277 | 29 |
| Other | | | | | | | | 77 |
| Rakes | | | | | | | | 29 |

### CATCH: By counties

| Species | Anne Arundel | | Baltimore | | Calvert | | Caroline | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 463, 200 | $4, 822 | 11, 600 | $233 | 108, 000 | $851 | 20, 500 | $404 |
| Black bass | 200 | 10 | 600 | 70 | | | 700 | 67 |
| Bluefish | 6, 700 | 410 | | | 200 | 16 | | |
| Butterfish | 200 | 16 | | | | | | |
| Carp | 4, 000 | 262 | 4, 700 | 159 | 1, 600 | 79 | 1, 600 | 106 |
| Catfish and bullheads | 17, 700 | 445 | 15, 300 | 638 | 4, 800 | 158 | 23, 300 | 627 |
| Crappie | | | 600 | 42 | | | 300 | 18 |
| Croaker | 207, 500 | 4, 231 | | | 84, 000 | 1, 260 | 5, 000 | 130 |
| Eels, common | 6, 600 | 435 | 13, 300 | 1, 319 | 1, 000 | 80 | 1, 200 | 50 |
| Flounders | 3, 600 | 132 | 400 | 20 | 100 | 5 | | |
| Gizzard shad | 15, 400 | 207 | 15, 800 | 228 | 1, 000 | 10 | 4, 300 | 126 |
| Hickory shad | 3, 200 | 38 | | | 1, 300 | 39 | 200 | 7 |
| Menhaden | 12, 000 | 120 | | | | | | |
| Mullet | | | 100 | 4 | 700 | 45 | | |
| Pike or pickerel | 500 | 85 | 2, 200 | 487 | 200 | 30 | 700 | 74 |
| Shad | 27, 200 | 2, 901 | | | 9, 900 | 1, 015 | 7, 100 | 1, 120 |
| Spanish mackerel | 6, 500 | 666 | | | | | | |
| Spot | 4, 300 | 129 | 200 | 4 | 1, 000 | 50 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 364, 500 | 13, 073 | 2, 100 | 198 | 6, 000 | 280 | 2, 000 | 100 |
| Spotted | | | | | 100 | 10 | | |
| Striped bass | 410, 800 | 26, 716 | 23, 000 | 2, 457 | 39, 100 | 2, 786 | 129, 000 | 10, 964 |
| Suckers | | | | | | | 100 | 3 |
| Sunfish | 400 | 10 | | | | | | |
| Tuna | 100 | 8 | | | | | | |
| White perch | 13, 300 | 506 | 6, 100 | 352 | 1, 100 | 35 | 85, 400 | 2, 882 |
| Yellow perch | 4, 100 | 340 | 6, 900 | 524 | 1, 200 | 122 | 13, 000 | 749 |
| Crabs: | | | | | | | | |
| Hard | 817, 600 | 18, 190 | 100, 000 | 3, 000 | 600, 000 | 14, 000 | | |
| Soft and peelers | 55, 900 | 5, 913 | 11, 000 | 1, 800 | 51, 600 | 5, 702 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 1, 123, 500 | 74, 901 | 37, 200 | 3, 100 | 189, 300 | 13, 325 | | |
| Public, fall | 1, 313, 600 | 97, 956 | 154, 000 | 11, 565 | 459, 200 | 34, 233 | | |
| Private, spring | | | | | 78, 000 | 6, 500 | | |
| Private, fall | | | | | 132, 000 | 11, 000 | | |
| Total | 4, 882, 600 | 252, 522 | 405, 100 | 26, 200 | 1, 771, 400 | 91, 631 | 294, 400 | 17, 427 |

## *Fisheries of Maryland, 1937*—Continued

CATCH: BY COUNTIES—Continued

| Species | Cecil | | Charles | | Dorchester | | Hartford | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 230,900 | $2,241 | 10,000 | $100 | 377,300 | $4,882 | 306,100 | $3,023 |
| Black bass | 31,400 | 4,021 | 1,500 | 140 | 600 | 57 | 4,900 | 412 |
| Bluefish | | | | | 4,500 | 417 | | |
| Butterfish | | | | | 3,000 | 144 | | |
| Carp | 46,000 | 3,160 | 33,700 | 1,748 | 4,800 | 165 | 37,600 | 2,921 |
| Catfish and bullheads | 116,700 | 3,334 | 105,700 | 2,353 | 18,800 | 623 | 36,000 | 1,105 |
| Crappie | 400 | 16 | | | 200 | 16 | 100 | 3 |
| Croaker | | | 1,800 | 90 | 106,500 | 2,098 | | |
| Drum: | | | | | | | | |
| Black | | | | | 600 | 6 | | |
| Red or redfish | | | | | 600 | 6 | | |
| Eels, common | 12,400 | 1,063 | 1,100 | 108 | 84,800 | 7,498 | 5,800 | 580 |
| Flounders | | | | | 10,200 | 528 | | |
| Gizzard shad | 2,500 | 38 | 17,600 | 297 | 24,300 | 312 | 800 | 4 |
| Harvestfish or "starfish" | | | | | 800 | 36 | | |
| Hickory shad | 1,500 | 51 | 100 | 2 | 3,200 | 77 | 800 | 22 |
| King whiting or "kingfish" | | | | | 200 | 6 | | |
| Mullet | 100 | 2 | | | | | | |
| Pike or pickerel | 17,400 | 2,413 | 2,000 | 325 | 400 | 34 | 11,000 | 2,187 |
| Shad | 18,400 | 1,800 | 11,500 | 1,326 | 65,000 | 5,321 | 16,300 | 1,583 |
| Spanish mackerel | | | | | 500 | 50 | | |
| Spot | | | | | 2,200 | 70 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | 300 | 15 | 10,600 | 345 | | |
| Spotted | | | | | 3,700 | 228 | | |
| Striped bass | 21,300 | 1,768 | 109,000 | 7,197 | 183,000 | 16,320 | 48,600 | 3,887 |
| Suckers | 300 | 10 | | | | | 900 | 46 |
| Sunfish | | | | | 500 | 20 | 600 | 19 |
| White perch | 31,900 | 1,343 | 21,600 | 1,055 | 50,200 | 2,063 | 8,400 | 488 |
| Yellow perch | 66,700 | 4,283 | 6,000 | 386 | 2,800 | 172 | 17,300 | 1,073 |
| Crabs: | | | | | | | | |
| Hard | | | 557,900 | 22,428 | 6,856,900 | 137,138 | | |
| Soft and peelers | | | 6,700 | 1,097 | 171,000 | 13,686 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | | | 142,200 | 12,178 | 1,012,100 | 72,825 | | |
| Public, fall | | | 243,100 | 20,836 | 1,970,900 | 144,547 | | |
| Private, spring | | | 41,400 | 3.348 | | | | |
| Private, fall | | | 172,300 | 13,132 | | | | |
| Terrapin, diamond-back | | | | | 1,300 | 840 | | |
| Turtle, snapper | 5,000 | 350 | | | | | | |
| Total | 602,900 | 25,893 | 1,485,500 | 88,161 | 10,971,500 | 410,530 | 495,200 | 17,353 |

| Species | Kent | | Prince Georges | | Queen Annes | | St. Marys | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 99,300 | $936 | | | 5,100 | $64 | 528,800 | $5,703 |
| Black bass | 1,000 | 84 | 500 | $48 | | | | |
| Bluefish | 1,600 | 128 | | | | | 2,000 | 146 |
| Butterfish | | | | | | | 1,700 | 174 |
| Carp | 8,200 | 297 | 74,400 | 4,371 | 8,300 | 358 | 8,300 | 290 |
| Catfish and bullheads | 34,000 | 1,008 | 58,100 | 1,965 | 20,000 | 740 | 11,400 | 308 |
| Crappie | | | 1,000 | 74 | | | | |
| Croaker | 50,400 | 1,104 | 100 | 7 | 11,300 | 287 | 44,400 | 1,097 |
| Drum: | | | | | | | | |
| Black | | | | | | | 200 | 2 |
| Red or redfish | | | | | | | 100 | 3 |
| Eels, common | 10,400 | 852 | 1,300 | 112 | 17,800 | 1,354 | 1,100 | 88 |
| Flounders | 400 | 22 | | | | | 2,900 | 155 |
| Gizzard shad | 1,000 | 20 | 1,100 | 42 | 4,000 | 160 | 13,000 | 156 |
| Hickory shad | 800 | 25 | 100 | 3 | | | 7,000 | 138 |
| Menhaden | | | | | | | 3,000 | 50 |
| Pike or pickerel | 2,900 | 412 | 100 | 15 | | | 2,000 | 240 |
| Shad | 9,700 | 1,139 | 7,500 | 530 | | | 65,900 | 6,057 |
| Spanish mackerel | 1,300 | 109 | | | | | 2,400 | 263 |
| Spot | 6,800 | 357 | | | | | 2,500 | 131 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 123,500 | 5,391 | 200 | 23 | 500 | 20 | 28,100 | 1,262 |
| Spotted | 200 | 15 | | | | | 400 | 43 |
| Striped bass | 568,600 | 48,076 | 700 | 115 | 14,900 | 1,178 | 194,700 | 15,032 |
| Suckers | | | 1,000 | 74 | | | 500 | 10 |

## *Fisheries of Maryland, 1937*—Continued

CATCH: BY COUNTIES—Continued

| Species | Kent | | Prince Georges | | Queen Annes | | St. Marys | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| White perch | 30,700 | $1,147 | 1,600 | $169 | 8,100 | $379 | 7,700 | $383 |
| Yellow perch | 19,400 | 1,076 | 200 | 20 | 18,400 | 1,125 | 14,100 | 568 |
| Crabs: | | | | | | | | |
| Hard | 281,000 | 9,835 | -------- | ------- | 433,500 | 15,173 | 1,347,300 | 33,232 |
| Soft and peelers | 11,100 | 2,243 | -------- | ------- | 8,500 | 1,100 | 74,500 | 9,080 |
| Oysters, market: | | | | | | | | |
| Public, spring | 388,900 | 23,336 | -------- | ------- | 734,200 | 36,713 | 666,200 | 45,859 |
| Public, fall | 828,700 | 57,831 | -------- | ------- | 1,533,400 | 89,460 | 1,354,500 | 101,486 |
| Private, spring | -------- | ------- | -------- | ------- | -------- | ------- | 63,000 | 5,250 |
| Private, fall | -------- | ------- | -------- | ------- | -------- | ------- | 81,000 | 6,750 |
| Total | 2,479,900 | 155,443 | 147,900 | 7,568 | 2,818,000 | 148,111 | 4,528,700 | 233,956 |

| Species | Somerset | | Talbot | | Wicomico | | Worcester | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 32,400 | $468 | 1,570,900 | $14,894 | 44,800 | $851 | 10,200 | $106 |
| Bluefish | 6,500 | 650 | 400 | 42 | -------- | ------- | 59,000 | 4,900 |
| Bonito | -------- | ------- | -------- | ------- | -------- | ------- | 16,500 | 775 |
| Butterfish | 2,500 | 91 | 100 | 10 | 9,000 | 360 | 75,000 | 3,527 |
| Carp | 600 | 12 | 4,900 | 241 | 800 | 38 | -------- | ------- |
| Catfish and bullheads | 5,800 | 266 | 20,700 | 601 | 12,100 | 384 | -------- | ------- |
| Crappie | -------- | ------- | -------- | ------- | 100 | 3 | -------- | ------- |
| Croaker | 61,600 | 784 | 52,400 | 802 | 62,800 | 853 | 295,100 | 5,428 |
| Drum: | | | | | | | | |
| Black | -------- | ------- | -------- | ------- | -------- | ------- | 30,000 | 350 |
| Red or redfish | 1,500 | 40 | -------- | ------- | -------- | ------- | -------- | ------- |
| Eels: | | | | | | | | |
| Common | 2,300 | 115 | 26,400 | 1,866 | 4,300 | 428 | 1,500 | 120 |
| Conger | -------- | ------- | -------- | ------- | -------- | ------- | 400 | 8 |
| Flounders | 2,700 | 257 | 100 | 12 | 1,500 | 144 | 8,100 | 454 |
| Gizzard shad | 2,300 | 23 | -------- | ------- | 9,700 | 159 | -------- | ------- |
| Hake | -------- | ------- | -------- | ------- | -------- | ------- | 2,500 | 40 |
| Harvestfish or "starfish" | -------- | ------- | -------- | ------- | -------- | ------- | 2,000 | 40 |
| Hickory shad | 300 | 15 | 6,600 | 158 | 100 | 2 | 3,000 | 60 |
| Hogchoker | 11,700 | 351 | -------- | ------- | 6,000 | 120 | -------- | ------- |
| King whiting or "kingfish" | -------- | ------- | -------- | ------- | 600 | 60 | 6,500 | 335 |
| Mackerel | -------- | ------- | -------- | ------- | -------- | ------- | 2,000 | 120 |
| Mullet | -------- | ------- | -------- | ------- | -------- | ------- | 2,000 | 80 |
| Pike or pickerel | -------- | ------- | 500 | 75 | -------- | ------- | -------- | ------- |
| Scup | -------- | ------- | -------- | ------- | -------- | ------- | 26,900 | 590 |
| Sea bass | 100 | 4 | -------- | ------- | -------- | ------- | 15,000 | 900 |
| Shad | 13,800 | 1,368 | 107,700 | 10.245 | 30,500 | 3,638 | 14,300 | 1,495 |
| Spanish mackerel | -------- | ------- | 600 | 65 | -------- | ------- | 22,500 | 1,225 |
| Spot | -------- | ------- | 600 | 31 | 5,000 | 250 | 5,000 | 150 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 5,000 | 195 | 49,500 | 2,285 | 41,300 | 1,408 | 456,200 | 9,992 |
| Spotted | -------- | ------- | -------- | ------- | 3,000 | 230 | -------- | ------- |
| Striped bass | 15,500 | 986 | 132,200 | 9,730 | 115,900 | 9,162 | 5,000 | 435 |
| Tautog | -------- | ------- | -------- | ------- | -------- | ------- | 200 | 10 |
| White perch | 8,700 | 448 | 10,100 | 651 | 10,400 | 676 | 1,400 | 91 |
| Yellow perch | -------- | ------- | 15,800 | 1,272 | 1,300 | 88 | -------- | ------- |
| Crabs: | | | | | | | | |
| Hard | 2,000,700 | 54,757 | 1,805,800 | 54,174 | 25,000 | 500 | 1,372.600 | 30,877 |
| Soft and peelers | 2,035,700 | 162,257 | 13,600 | 2,087 | 1,200 | 110 | 73,300 | 6,121 |
| Clams, hard, public | -------- | ------- | -------- | ------- | -------- | ------- | 64.000 | 12,000 |
| Oysters, market: | | | | | | | | |
| Public, spring | 858,000 | 64,308 | 912,100 | 43,578 | 159,500 | 15,966 | -------- | ------- |
| Public, fall | 2,372,000 | 168,719 | 1,564,800 | 91,300 | 1,141,800 | 85,635 | -------- | ------- |
| Private, spring | 54,000 | 4,050 | -------- | ------- | 24,000 | 1,800 | 324,700 | 69,445 |
| Private, fall | 179,500 | 13,463 | -------- | ------- | 108,000 | 8,100 | 312,600 | 66,979 |
| Squid | -------- | ------- | -------- | ------- | -------- | ------- | 73,000 | 1,120 |
| Terrapin, diamond-back | 2,200 | 750 | -------- | ------- | -------- | ------- | -------- | ------- |
| Total | 7,675,400 | 474,377 | 6,295,800 | 234,119 | 1,818,700 | 130,965 | 3,279,600 | 217,773 |

## VIRGINIA

### *Fisheries of Virginia, 1937*

OPERATING UNITS: BY GEAR

| Item | Purse seines, menhaden | Haul seines | Gill nets | | | Lines, hand |
|---|---|---|---|---|---|---|
| | | | Anchor | Drift | Stake | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 1,205 | | | | | |
| On boats and shore: | | | | | | |
| Regular | | 270 | 6 | 16 | 89 | 11 |
| Casual | | 220 | | 336 | 193 | 24 |
| Total | 1,205 | 490 | 6 | 352 | 282 | 35 |
| Vessels: | | | | | | |
| Steam: | | | | | | |
| 41 to 50 tons | 1 | | | | | |
| 61 to 70 tons | 1 | | | | | |
| 71 to 80 tons | 2 | | | | | |
| 81 to 90 tons | 4 | | | | | |
| 91 to 100 tons | 5 | | | | | |
| 101 to 110 tons | 3 | | | | | |
| 131 to 140 tons | 2 | | | | | |
| 141 to 150 tons | 1 | | | | | |
| 151 to 160 tons | 2 | | | | | |
| 161 to 170 tons | 1 | | | | | |
| 171 to 180 tons | 2 | | | | | |
| 191 to 200 tons | 1 | | | | | |
| Total | 25 | | | | | |
| Net tonnage | 2,833 | | | | | |
| Motor: | | | | | | |
| 11 to 20 tons | 1 | | | | | |
| 21 to 30 tons | 1 | | | | | |
| 31 to 40 tons | 1 | | | | | |
| 61 to 70 tons | 1 | | | | | |
| 71 to 80 tons | 3 | | | | | |
| 101 to 110 tons | 1 | | | | | |
| 111 to 120 tons | 1 | | | | | |
| 121 to 130 tons | 1 | | | | | |
| 131 to 140 tons | 1 | | | | | |
| Total | 11 | | | | | |
| Net tonnage | 844 | | | | | |
| Total vessels | 36 | | | | | |
| Total net tonnage | 3,667 | | | | | |
| Boats: | | | | | | |
| Motor | | 83 | 3 | 37 | 109 | 20 |
| Other | | 159 | | 193 | 169 | 3 |
| Accessory boats | 105 | | | | | |
| Apparatus: | | | | | | |
| Number | 36 | 139 | 3 | 223 | 5,963 | 93 |
| Length, yards | 11,050 | 53,876 | | | | |
| Square yards | | | 3,600 | 201,605 | 135,732 | |
| Hooks, baits, or snoods | | | | | | 161 |

## *Fisheries of Virginia, 1937*—Continued

### OPERATING UNITS: BY GEAR—Continued

| Item | Lines—Continued | | Pound nets | Crab pound nets | Stop nets | Fyke nets | Dip nets | Otter trawls |
|---|---|---|---|---|---|---|---|---|
| | Trot with baits or snoods | Trot with hooks | | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | | | | | 94 |
| On boats and shore: | | | | | | | | |
| Regular | 1,479 | | 1,531 | 69 | | 60 | 695 | |
| Casual | 483 | 7 | 298 | 12 | 4 | 125 | 745 | |
| Total | 1,962 | 7 | 1,829 | 81 | 4 | 185 | 1,440 | 94 |
| Vessels, motor: | | | | | | | | |
| 5 to 10 tons | | | | | | | | 6 |
| 11 to 20 tons | | | | | | | | 6 |
| 21 to 30 tons | | | | | | | | 3 |
| 31 to 40 tons | | | | | | | | 4 |
| Total | | | | | | | | 19 |
| Net tonnage | | | | | | | | 358 |
| Boats: | | | | | | | | |
| Motor | 1,567 | 1 | 350 | 57 | 2 | 54 | 30 | |
| Other | 395 | 5 | 535 | 15 | 2 | 106 | 1,390 | |
| Apparatus: | | | | | | | | |
| Number | 1,962 | 5 | 1,656 | 277 | 2 | 762 | 1,440 | 19 |
| Square yards | | | | | 1,300 | | | |
| Yards at mouth | | | | | | | | 515 |
| Hooks, baits, or snoods | 1,023,610 | 2,550 | | | | | | |

| Item | Slat traps | Pots | | | Scrapes | Dredges | | |
|---|---|---|---|---|---|---|---|---|
| | | Crab | Eel | Fish | | Crab | Oyster | Scallop |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | | | 308 | 112 | 4 |
| On boats and shore: | | | | | | | | |
| Regular | | 36 | 13 | 12 | 118 | | | |
| Casual | 2 | 23 | 15 | 21 | | | | |
| Total | 2 | 59 | 28 | 33 | 118 | 308 | 112 | 4 |
| Vessels, motor: | | | | | | | | |
| 5 to 10 tons | | | | | | 62 | 8 | |
| 11 to 20 tons | | | | | | 31 | 13 | 1 |
| 21 to 30 tons | | | | | | 6 | 2 | |
| 41 to 50 tons | | | | | | | 2 | |
| Total | | | | | | 99 | 25 | 1 |
| Net tonnage | | | | | | 1,038 | 392 | 18 |
| Boats: | | | | | | | | |
| Motor | | 41 | 13 | 10 | 74 | | | |
| Other | 2 | 15 | 10 | 13 | | | | |
| Apparatus: | | | | | | | | |
| Number | 4 | 1,060 | 677 | 221 | 114 | 198 | 53 | 2 |
| Yards at mouth | | | | | 117 | 382 | 84 | 6 |

## *Fisheries of Virginia, 1937*—Continued

### OPERATING UNITS: BY GEAR—Continued

| Item | Tongs | | Rakes, oyster | Picks | By hand | | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|
| | Oyster | Other | | | Oyster | Other | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | | | | 1,666 |
| On boats and shore: | | | | | | | |
| Regular | 2,407 | 332 | 495 | 375 | 100 | 310 | 4,851 |
| Casual | 680 | 36 | 20 | | 25 | 75 | 3,070 |
| Total | 3,087 | 368 | 515 | 375 | 125 | 385 | 9,587 |
| Vessels: | | | | | | | |
| Steam: | | | | | | | |
| 41 to 50 tons | | | | | | | 1 |
| 61 to 70 tons | | | | | | | 1 |
| 71 to 80 tons | | | | | | | 2 |
| 81 to 90 tons | | | | | | | 4 |
| 91 to 100 tons | | | | | | | 5 |
| 101 to 110 tons | | | | | | | 3 |
| 131 to 140 tons | | | | | | | 2 |
| 141 to 150 tons | | | | | | | 1 |
| 151 to 160 tons | | | | | | | 2 |
| 161 to 170 tons | | | | | | | 1 |
| 171 to 180 tons | | | | | | | 2 |
| 191 to 200 tons | | | | | | | 1 |
| Total | | | | | | | 25 |
| Net tonnage | | | | | | | 2,833 |
| Motor: | | | | | | | |
| 5 to 10 tons | | | | | | | 69 |
| 11 to 20 tons | | | | | | | 43 |
| 21 to 30 tons | | | | | | | 12 |
| 31 to 40 tons | | | | | | | 5 |
| 41 to 50 tons | | | | | | | 2 |
| 61 to 70 tons | | | | | | | 1 |
| 71 to 80 tons | | | | | | | 3 |
| 101 to 110 tons | | | | | | | 1 |
| 111 to 120 tons | | | | | | | 1 |
| 121 to 130 tons | | | | | | | 1 |
| 131 to 140 tons | | | | | | | 1 |
| Total | | | | | | | 139 |
| Net tonnage | | | | | | | 2,469 |
| Total vessels | | | | | | | 164 |
| Total net tonnage | | | | | | | 5,302 |
| Boats: | | | | | | | |
| Motor | 1,500 | 113 | 66 | 15 | | | 3,366 |
| Other | 271 | 199 | 423 | 310 | 50 | 75 | 3,004 |
| Accessory boats | | | | | | | 105 |
| Apparatus, number | 2,877 | 353 | 515 | 375 | | | |

### CATCH: BY GEAR

| Species | Purse seines | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Anchor | | Drift | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 626,800 | $6,570 | | | 4,000 | $51 |
| Bluefish | | | 135,100 | 5,739 | 600 | $42 | 800 | 80 |
| Bonito | | | 400 | 17 | | | | |
| Butterfish | | | 19,900 | 267 | | | | |
| Cabio or crab eater | | | 700 | 28 | | | | |
| Carp | | | 244,600 | 5,158 | | | 1,000 | 20 |
| Catfish and bullheads | | | 82,700 | 2,760 | | | | |
| Croaker | | | 5,154,100 | 82,690 | 65,000 | 975 | 50,000 | 2,000 |
| Drum, red or redfish | | | 11,900 | 230 | | | | |
| Eels, common | | | 1,800 | 95 | | | | |
| Flounders | | | 34,800 | 1,529 | | | | |
| Gizzard shad | | | 71,000 | 795 | | | 3,000 | 30 |
| Harvestfish | | | 13,900 | 278 | | | | |
| Hickory shad | | | 6,500 | 124 | | | | |
| King whiting or "kingfish" | | | 43,900 | 1,317 | | | | |

### *Fisheries of Virginia, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Purse seines | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Anchor | | Drift | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Mackerel | | | 1,700 | $34 | | | | |
| Menhaden | 119,763,000 | $478,923 | | | | | | |
| Mullet | | | 5,800 | 114 | | | | |
| Pompano | | | 400 | 40 | | | | |
| Shad | | | 9,500 | 947 | | | 136,300 | $13,428 |
| Skates | | | 15,800 | 158 | | | | |
| Spanish mackerel | | | 13,900 | 635 | | | | |
| Spot | | | 1,180,000 | 22,646 | 18,000 | $540 | | |
| Squeteagues or "sea trout: | | | | | | | | |
| Gray | | | 255,400 | 4,823 | | | 400 | 20 |
| Spotted | | | 130,600 | 6,476 | | | | |
| Striped bass | | | 99,400 | 6,896 | | | 24,500 | 1,715 |
| Sturgeon | | | | | | | 400 | 60 |
| Suckers | | | 300 | 6 | | | | |
| White perch | | | 27,900 | 801 | 600 | 24 | | |
| Yellow perch | | | 10,800 | 502 | | | | |
| Crabs, soft and peelers | | | 31,200 | 3,160 | | | | |
| Total | 119,763,000 | 478,923 | 8,230,800 | 154,835 | 84,200 | 1,581 | 220,400 | 17,404 |

| Species | Gill nets—Continued | | Lines | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Stake | | Hand | | Trot with baits or snoods | | Trot with hooks | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 12,300 | $213 | | | | | | |
| Bluefish | | | 42,100 | $4,437 | | | | |
| Bonito | | | 100 | 8 | | | | |
| Catfish and bullheads | | | | | | | 5,800 | $152 |
| Croaker | 13,000 | 164 | 15,300 | 765 | | | | |
| Flounders | | | 4,000 | 348 | | | | |
| Gizzard shad | 5,000 | 50 | | | | | | |
| King whiting or "kingfish" | | | 300 | 15 | | | | |
| Mackerel | | | 200 | 20 | | | | |
| Mullet | 2,000 | 60 | | | | | | |
| Scup | | | 43,000 | 1,351 | | | | |
| Sea bass | | | 70,400 | 2,112 | | | | |
| Shad | 149,300 | 15,305 | | | | | | |
| Spanish mackerel | | | 4,400 | 174 | | | | |
| Spot | 9,500 | 143 | 1,700 | 34 | | | | |
| Squeteagues or "sea trout," gray | 1,000 | 15 | 77,700 | 3,887 | | | | |
| Striped bass | 202,600 | 16,185 | | | | | | |
| White perch | 1,800 | 60 | | | | | | |
| Yellow perch | 1,000 | 20 | | | | | | |
| Crabs: | | | | | | | | |
| Hard | | | | | 22,303,300 | $376,404 | | |
| Soft and peelers | | | | | 30,500 | 3,025 | | |
| Turtles, snapper | | | 1,500 | 22 | | | | |
| Total | 397,500 | 32,215 | 260,700 | 13,173 | 22,333,800 | 379,429 | 5,800 | 152 |

| Species | Pound nets | | Crab pound nets | | Stop nets | | Fyke nets | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 14,399,600 | $140,713 | | | | | 17,900 | $252 |
| Bluefish | 344,000 | 12,116 | | | | | | |
| Bonito | 17,600 | 701 | | | | | | |
| Butterfish | 1,866,000 | 26,576 | | | | | | |
| Cabio or crab eater | 19,400 | 687 | | | | | | |
| Carp | 66,500 | 1,303 | | | 25,400 | $508 | 56,200 | 1,038 |
| Catfish and bullheads | 159,200 | 4,759 | | | 1,300 | 52 | 239,300 | 8,270 |
| Croaker | 25,133,300 | 347,634 | | | | | 30,700 | 522 |
| Drum: | | | | | | | | |
| Black | 16,600 | 190 | | | | | | |
| Red or redfish | 19,900 | 361 | | | | | 100 | 2 |
| Eels, common | 68,400 | 7,985 | | | | | 5,200 | 383 |
| Flounders | 313,100 | 13,085 | | | | | 1,600 | 48 |
| Gizzard shad | 138,000 | 1,405 | | | | | 15,600 | 171 |
| Harvestfish | 1,076,600 | 19,524 | | | | | | |

### *Fisheries of Virginia, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Pound nets | | Crab pound nets | | Stop nets | | Fyke nets | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Hickory shad | 78,100 | $1,622 | | | | | | |
| Hogfish | 600 | 18 | | | | | | |
| King whiting or "kingfish" | 29,600 | 846 | | | | | | |
| Mackerel | 98,800 | 1,977 | | | | | | |
| Menhaden | 2,202,000 | 5,981 | | | | | | |
| Mullet | 3,600 | 108 | | | | | | |
| Pike or pickerel | | | | | | | 300 | $30 |
| Pompano | 10,700 | 948 | | | | | | |
| Scup | 20,300 | 408 | | | | | | |
| Sea bass | 5,100 | 126 | | | | | | |
| Shad | 2,782,400 | 242,490 | | | | | 8,000 | 870 |
| Sharks | 2,000 | 60 | | | | | | |
| Sheepshead | 100 | 2 | | | | | | |
| Skates | 600 | 3 | | | | | | |
| Spanish mackerel | 787,200 | 17,198 | | | | | | |
| Spot | 1,702,000 | 29,938 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 11,108,000 | 195,848 | | | | | 9,800 | 197 |
| Spotted | 9,900 | 563 | | | | | | |
| Striped bass | 624,100 | 35,097 | | | | | 53,900 | 2,864 |
| Sturgeon | 5,600 | 656 | | | | | | |
| Swellfish | 6,700 | 67 | | | | | | |
| White perch | 98,900 | 2,625 | | | | | 58,700 | 1,572 |
| Yellow perch | 3,600 | 171 | | | | | 61,200 | 2,830 |
| Crabs: | | | | | | | | |
| Hard | 115,000 | 2,300 | 82,500 | $1,468 | | | | |
| Soft and peelers | | | 286,800 | 29,200 | | | | |
| Squid | 85,500 | 1,641 | | | | | | |
| Total | 63,418,600 | 1,117,732 | 369,300 | 30,668 | 26,700 | $560 | 558,500 | 19,049 |

| Species | Dip nets | | Otter trawls | | Slat traps | | Pots | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Crab | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 200 | $2 | 3,500 | $70 | | |
| Bluefish | | | 5,900 | 773 | | | | |
| Bonito | | | 100 | 6 | | | | |
| Butterfish | | | 70,500 | 1,856 | | | | |
| Catfish and bullheads | | | | | 1,700 | 85 | | |
| Cod | | | 900 | 17 | | | | |
| Croaker | | | 2,650,300 | 63,413 | | | | |
| Drum, red or redfish | | | 11,400 | 175 | | | | |
| Eels, conger | | | 400 | 7 | | | | |
| Flounders | | | 146,500 | 10,883 | | | | |
| Gizzard shad | | | | | 6,000 | 120 | | |
| Grayfish | | | 5,400 | 170 | | | | |
| Hake | | | 500 | 10 | | | | |
| King whiting or "kingfish" | | | 62,000 | 2,016 | | | | |
| Scup | | | 1,868,100 | 29,249 | | | | |
| Sea bass | | | 122,000 | 6,348 | | | | |
| Sea robin | | | 2,800 | 44 | | | | |
| Shad | | | 300 | 33 | | | | |
| Sharks | | | 4,200 | 147 | | | | |
| Snapper, red | | | 100 | 4 | | | | |
| Spot | | | 67,300 | 1,358 | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | 1,154,400 | 28,452 | | | | |
| Spotted | | | 100 | 3 | | | | |
| Sturgeon | | | 6,700 | 639 | | | | |
| Swellfish | | | 1,700 | 50 | | | | |
| Tautog | | | 300 | 11 | | | | |
| Tomcod | | | 100 | 1 | | | | |
| White perch | | | 7,400 | 98 | | | | |
| Whiting | | | 17,200 | 194 | | | | |
| Crabs: | | | | | | | | |
| Hard | 12,000 | $180 | | | | | 438,000 | $8,260 |
| Soft and peelers | 1,346,500 | 125,910 | | | | | 51,500 | 5,120 |
| Shrimp | | | 1,700 | 120 | | | | |
| Squid | | | 26,400 | 460 | | | | |
| Total | 1,358,500 | 126,090 | 6,234,900 | 146,539 | 11,200 | 275 | 489,500 | 13,380 |

## *Fisheries of Virginia, 1937*—Continued

### CATCH: BY GEAR—Continued

| Species | Pots—Continued |  |  |  | Scrapes |  | Dredges |  |
|---|---|---|---|---|---|---|---|---|
|  | Eel |  | Fish |  |  |  |  |  |
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Catfish and bullheads | 5,000 | $300 | 112,100 | $5,090 |  |  |  |  |
| Eels, common | 43,600 | 2,366 | 6,500 | 355 |  |  |  |  |
| White perch |  |  | 100 | 3 |  |  |  |  |
| Crabs: |  |  |  |  |  |  |  |  |
| Hard |  |  |  |  | 74,000 | $1,480 | 4,902,700 | $174,960 |
| Soft and peelers |  |  |  |  | 455,000 | 36,400 |  |  |
| Oysters, market: |  |  |  |  |  |  |  |  |
| Private, spring |  |  |  |  |  |  | 256,800 | 22,830 |
| Private, fall |  |  |  |  |  |  | 2,545,400 | 192,560 |
| Scallops, sea |  |  |  |  |  |  | 10,800 | 1,426 |
| Total | 48,600 | 2,666 | 118,700 | 5,448 | 529,000 | 37,880 | 7,715,700 | 391,776 |

| Species | Tongs |  | Rakes |  | Picks |  | By hand |  |
|---|---|---|---|---|---|---|---|---|
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs, soft and peelers |  |  |  |  |  |  | 273,800 | $22,100 |
| Clams: |  |  |  |  |  |  |  |  |
| Hard, public | 1,089,100 | $173,742 |  |  | 277,000 | $49,200 | 258,000 | 46,090 |
| Hard, private | 7,000 | 1,750 |  |  |  |  |  |  |
| Mussels, sea |  |  |  |  |  |  | 27,700 | 788 |
| Oysters, market: |  |  |  |  |  |  |  |  |
| Public, spring | 1,276,800 | 87,875 |  |  |  |  | 7,800 | 585 |
| Public, fall | 2,104,800 | 144,570 |  |  |  |  |  |  |
| Private, spring | 1,320,000 | 94,150 | 750,000 | $51,400 |  |  | 21,000 | 1,350 |
| Private, fall | 1,579,400 | 107,830 | 1,082,000 | 75,300 |  |  | 42,000 | 2,700 |
| Total | 7,377,100 | 609,917 | 1,832,000 | 126,700 | 277,000 | 49,200 | 630,300 | 73,613 |

### OPERATING UNITS: BY COUNTIES

| Item | Accomac | Arlington | Caroline | Charles City | Chesterfield | Dinwiddie | Elizabeth City | Essex |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 32 |  |  |  |  |  | 97 |  |
| On boats and shore: |  |  |  |  |  |  |  |  |
| Regular | 1,005 |  |  |  |  |  | 138 | 47 |
| Casual | 264 | 56 | 4 | 89 | 39 | 6 | 14 | 44 |
| Total | 1,301 | 56 | 4 | 89 | 39 | 6 | 249 | 91 |
| Vessels, motor: |  |  |  |  |  |  |  |  |
| 5 to 10 tons | 1 |  |  |  |  |  | 9 |  |
| 11 to 20 tons | 1 |  |  |  |  |  | 10 |  |
| 21 to 30 tons | 1 |  |  |  |  |  | 3 |  |
| 31 to 40 tons |  |  |  |  |  |  | 1 |  |
| Total | 3 |  |  |  |  |  | 23 |  |
| Net tonnage | 47 |  |  |  |  |  | 320 |  |
| Boats: |  |  |  |  |  |  |  |  |
| Motor | 666 | 10 |  | 1 | 2 |  | 56 | 24 |
| Other | 611 | 22 | 2 | 60 | 20 | 4 | 25 | 22 |
| Apparatus: |  |  |  |  |  |  |  |  |
| Purse seines, menhaden | 1 |  |  |  |  |  |  |  |
| Length, yards | 280 |  |  |  |  |  |  |  |
| Haul seines | 19 | 5 |  | 2 | 5 |  |  | 8 |
| Length, yards | 9,595 | 1,600 |  | 350 | 1,550 |  |  | 2,350 |
| Gill nets: |  |  |  |  |  |  |  |  |
| Drift | 4 | 14 | 1 | 60 | 10 | 1 |  |  |
| Square yards | 8,000 | 20,580 | 1,200 | 67,825 | 6,000 | 600 |  |  |
| Stake |  | 20 |  | 20 | 65 |  |  | 5 |
| Square yards |  | 360 |  | 400 | 1,800 |  |  | 3,100 |
| Lines: |  |  |  |  |  |  |  |  |
| Hand | 60 |  |  |  |  |  |  |  |
| Hooks | 120 |  |  |  |  |  |  |  |
| Trot with baits or snoods | 378 |  |  |  |  |  | 35 | 7 |
| Baits or snoods | 233,600 |  |  |  |  |  | 17,500 | 1,600 |

## *Fisheries of Virginia, 1937*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Accomac | Arlington | Caroline | Charles City | Chesterfield | Dinwiddie | Elizabeth City | Essex |
|---|---|---|---|---|---|---|---|---|
| Apparatus—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Pound nets | 203 | | | | | | 155 | 2 |
| Fyke nets | 9 | 28 | 2 | 17 | 3 | | 8 | 10 |
| Dip nets | 300 | | | | | | | |
| Otter trawls | | | | | | | 5 | |
| Yards at mouth | | | | | | | 143 | |
| Slat traps | | | | | | 4 | | |
| Pots: | | | | | | | | |
| Eel | | 12 | | | | 5 | | |
| Fish | | | | 40 | 20 | | | |
| Scrapes | 108 | | | | | | | |
| Yards at mouth | 111 | | | | | | | |
| Dredges: | | | | | | | | |
| Crab | 6 | | | | | | 30 | |
| Yards at mouth | 12 | | | | | | 58 | |
| Oyster | | | | | | | 16 | |
| Yards at mouth | | | | | | | 24 | |
| Scallop | | | | | | | 2 | |
| Yards at mouth | | | | | | | 6 | |
| Tongs: | | | | | | | | |
| Oyster | 576 | | | | | | | 47 |
| Other | 197 | | | | | | 5 | |
| Rakes, oyster | 215 | | | | | | | |
| Picks | 175 | | | | | | | |

| Item | Fairfax | Gloucester | Henrico | Isle of Wight | James City | King and Queen | King George | King William |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | 48 | | | | | | |
| On boats and shore: | | | | | | | | |
| Regular | | 435 | | 298 | 11 | | 26 | |
| Casual | 38 | 57 | 27 | 75 | 34 | 34 | 80 | 71 |
| Total | 38 | 540 | 27 | 373 | 45 | 34 | 106 | 71 |
| Vessels, motor: | | | | | | | | |
| 5 to 10 tons | | 5 | | | | | | |
| 11 to 20 tons | | 10 | | | | | | |
| Total | | 15 | | | | | | |
| Net tonnage | | 179 | | | | | | |
| Boats: | | | | | | | | |
| Motor | 12 | 239 | | 178 | 11 | 9 | 38 | 11 |
| Other | 21 | 77 | 16 | 64 | 25 | 25 | 45 | 33 |
| Apparatus: | | | | | | | | |
| Haul seines | | 1 | 6 | | 4 | | 5 | 1 |
| Length, yards | | 700 | 1,100 | | 1,200 | | 1,460 | 90 |
| Gill nets: | | | | | | | | |
| Drift | 11 | | 8 | | 18 | 6 | 10 | 39 |
| Square yards | 16,400 | | 4,700 | | 10,800 | 2,000 | 4,400 | 22,400 |
| Stake | | 150 | | 179 | 655 | 420 | 975 | 200 |
| Square yards | | 3,432 | | 5,370 | 17,700 | 10,400 | 17,400 | 3,440 |
| Lines: | | | | | | | | |
| Hand | | | | | 25 | | | |
| Hooks | | | | | 25 | | | |
| Trot with baits or snoods | | 53 | | 74 | | | 21 | 10 |
| Baits or snoods | | 31,800 | | 51,800 | | | 10,500 | 3,000 |
| Trot with hooks | | | 2 | | | | | |
| Hooks | | | 500 | | | | | |
| Pound nets | | 93 | | | 8 | | 36 | |
| Crab pound nets | | 13 | | | | | | |
| Fyke nets | 208 | 28 | | 44 | 33 | | 75 | |
| Pots: | | | | | | | | |
| Crab | | 60 | | | | | | |
| Eel | 50 | | | | | | 15 | |
| Fish | | | | | 3 | | | |
| Dredges: | | | | | | | | |
| Crab | | 24 | | | | | | |
| Yards at mouth | | 46 | | | | | | |
| Oyster | | 6 | | | | | | |
| Yards at mouth | | 9 | | | | | | |
| Tongs: | | | | | | | | |
| Oyster | | 303 | | 242 | 3 | 2 | | 9 |
| Other | | 37 | | | | | | |

*Fisheries of Virginia, 1937*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Lancaster | Mathews | Middlesex | Nansemond | New Kent | Norfolk | Northampton | Northumberland |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 421 | 58 | 9 | -------- | -------- | 46 | 4 | 770 |
| On boats and shore: | | | | | | | | |
| Regular | 434 | 384 | 299 | 121 | 4 | 69 | 541 | 463 |
| Casual | 482 | 302 | 182 | 13 | 30 | 42 | 103 | 442 |
| Total | 1,337 | 744 | 490 | 134 | 34 | 157 | 648 | 1,675 |
| Vessels: | | | | | | | | |
| Steam: | | | | | | | | |
| 41 to 50 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 1 |
| 61 to 70 tons | 1 | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| 71 to 80 tons | 1 | -------- | -------- | -------- | -------- | -------- | -------- | 1 |
| 81 to 90 tons | 1 | -------- | -------- | -------- | -------- | -------- | -------- | 3 |
| 91 to 100 tons | 3 | -------- | -------- | -------- | -------- | -------- | -------- | 2 |
| 101 to 110 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 3 |
| 131 to 140 tons | 1 | -------- | -------- | -------- | -------- | -------- | -------- | 1 |
| 141 to 150 tons | 1 | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| 151 to 160 tons | 1 | -------- | -------- | -------- | -------- | -------- | -------- | 1 |
| 161 to 170 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 1 |
| 171 to 180 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 2 |
| 191 to 200 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 1 |
| Total | 9 | -------- | -------- | -------- | -------- | -------- | -------- | 16 |
| Net tonnage | 956 | -------- | -------- | -------- | -------- | -------- | -------- | 1,877 |
| Motor: | | | | | | | | |
| 5 to 10 tons | 1 | 7 | 1 | -------- | -------- | 1 | 1 | -------- |
| 11 to 20 tons | 1 | 7 | 2 | -------- | -------- | 2 | 1 | -------- |
| 21 to 30 tons | 1 | 4 | -------- | -------- | -------- | 1 | -------- | 1 |
| 31 to 40 tons | -------- | -------- | -------- | -------- | -------- | 1 | -------- | 1 |
| 41 to 50 tons | -------- | -------- | -------- | -------- | -------- | 2 | -------- | -------- |
| 61 to 70 tons | 1 | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| 71 to 80 tons | 3 | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| 101 to 110 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 1 |
| 111 to 120 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 1 |
| 121 to 130 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 1 |
| 131 to 140 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 1 |
| Total | 7 | 18 | 3 | -------- | -------- | 7 | 2 | 6 |
| Net tonnage | 343 | 247 | 43 | -------- | -------- | 185 | 18 | 536 |
| Total vessels | 16 | 18 | 3 | -------- | -------- | 7 | 2 | 22 |
| Total net tonnage | 1,299 | 247 | 43 | -------- | -------- | 185 | 18 | 2,413 |
| Boats: | | | | | | | | |
| Motor | 333 | 199 | 293 | 54 | 2 | 37 | 264 | 438 |
| Other | 370 | 224 | 108 | 28 | 27 | 40 | 247 | 580 |
| Accessory boats | 39 | -------- | -------- | -------- | -------- | -------- | -------- | 66 |
| Apparatus: | | | | | | | | |
| Purse seines, menhaden | 13 | -------- | -------- | -------- | -------- | -------- | -------- | 22 |
| Length, yards | 3,970 | -------- | -------- | -------- | -------- | -------- | -------- | 6,800 |
| Haul seines | 8 | 3 | 3 | -------- | 1 | 4 | 4 | 10 |
| Length, yards | 3,200 | 2,800 | 2,800 | -------- | 225 | 1,500 | 1,800 | 510 |
| Gill nets: | | | | | | | | |
| Drift | -------- | -------- | -------- | -------- | 19 | -------- | -------- | -------- |
| Square yards | -------- | -------- | -------- | -------- | 16,100 | -------- | -------- | -------- |
| Stake | -------- | 100 | -------- | 135 | 120 | -------- | -------- | -------- |
| Square yards | -------- | 3,000 | -------- | 4,050 | 3,300 | -------- | -------- | -------- |
| Lines: | | | | | | | | |
| Hand | -------- | -------- | -------- | -------- | -------- | -------- | 8 | -------- |
| Hooks | -------- | -------- | -------- | -------- | -------- | -------- | 16 | -------- |
| Trot with baits or snoods | 335 | 92 | 68 | 25 | 2 | 57 | 171 | 282 |
| Baits or snoods | 167,500 | 46,000 | 34,000 | 12,500 | 600 | 17,100 | 78,660 | 141,000 |
| Trot with hooks | -------- | -------- | -------- | -------- | 1 | -------- | -------- | -------- |
| Hooks | -------- | -------- | -------- | -------- | 50 | -------- | -------- | -------- |
| Pound nets | 162 | 399 | 13 | -------- | -------- | 31 | 99 | 269 |
| Crab pound nets | 30 | 51 | 13 | -------- | -------- | -------- | -------- | 90 |
| Fyke nets | -------- | -------- | -------- | 41 | 16 | -------- | -------- | -------- |
| Dip nets | 330 | 75 | 85 | -------- | -------- | -------- | 170 | 430 |
| Otter trawls | -------- | 1 | -------- | -------- | -------- | 2 | -------- | -------- |
| Yards at mouth | -------- | 30 | -------- | -------- | -------- | 60 | -------- | -------- |
| Pots: | | | | | | | | |
| Crab | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 1,000 |
| Eel | -------- | -------- | -------- | -------- | 15 | -------- | -------- | 40 |
| Fish | -------- | -------- | -------- | -------- | 14 | -------- | -------- | -------- |

*Fisheries of Virginia, 1937*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Lancaster | Mathews | Middlesex | Nansemond | New Kent | Norfolk | Northampton | Northumberland |
|---|---|---|---|---|---|---|---|---|
| Apparatus—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Scrapes | -------- | -------- | -------- | -------- | -------- | -------- | 6 | -------- |
| Yards at mouth | -------- | -------- | -------- | -------- | -------- | -------- | 6 | -------- |
| Dredges: | | | | | | | | |
| Crab | 2 | 34 | 4 | -------- | -------- | 2 | 2 | -------- |
| Yards at mouth | 3 | 66 | 8 | -------- | -------- | 4 | 4 | -------- |
| Oyster | 4 | 4 | 2 | -------- | -------- | 14 | 1 | -------- |
| Yards at mouth | 5 | 6 | 3 | -------- | -------- | 27 | 1 | -------- |
| Tongs: | | | | | | | | |
| Oyster | 309 | 73 | 378 | 100 | -------- | -------- | 193 | 169 |
| Other | -------- | 12 | -------- | -------- | -------- | -------- | 58 | -------- |
| Rakes, oyster | -------- | -------- | -------- | -------- | -------- | -------- | 300 | -------- |
| Picks | -------- | -------- | -------- | -------- | -------- | -------- | 200 | -------- |

| Item | Prince George | Princess Anne | Prince William | Richmond | Stafford | Surry | Warwick | Westmoreland | York |
|---|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | -------- | -------- | -------- | -------- | -------- | -------- | 8 | -------- | 173 |
| On boats and shore: | | | | | | | | | |
| Regular | -------- | 32 | -------- | 46 | 26 | 6 | 91 | 201 | 174 |
| Casual | 33 | 69 | 48 | 60 | 30 | 7 | 10 | 263 | 22 |
| Total | 33 | 101 | 48 | 106 | 56 | 13 | 109 | 464 | 369 |
| Vessels, motor: | | | | | | | | | |
| 5 to 10 tons | -------- | -------- | -------- | -------- | -------- | -------- | 1 | -------- | 42 |
| 11 to 20 tons | -------- | -------- | -------- | -------- | -------- | -------- | 1 | -------- | 8 |
| 21 to 30 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 1 |
| 31 to 40 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 2 |
| Total | -------- | -------- | -------- | -------- | -------- | -------- | 2 | -------- | 53 |
| Net tonnage | -------- | -------- | -------- | -------- | -------- | -------- | 28 | -------- | 523 |
| Boats: | | | | | | | | | |
| Motor | 4 | 34 | 12 | 21 | 15 | 5 | 42 | 239 | 117 |
| Other | 17 | 28 | 19 | 35 | 32 | 5 | 16 | 110 | 46 |
| Apparatus: | | | | | | | | | |
| Haul seines | 3 | 10 | 5 | 1 | 11 | 2 | -------- | 4 | 14 |
| Length, yards | 671 | 2,250 | 950 | 375 | 2,400 | 700 | -------- | 1,200 | 12,500 |
| Gill nets: | | | | | | | | | |
| Anchor | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 3 |
| Square yards | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 3,600 |
| Drift | 14 | -------- | 8 | -------- | -------- | -------- | -------- | -------- | -------- |
| Square yards | 11,500 | -------- | 9,100 | -------- | -------- | -------- | -------- | -------- | -------- |
| Stake | -------- | -------- | 414 | 720 | 1,020 | 240 | 500 | 25 | -------- |
| Square yards | -------- | -------- | 8,180 | 10,800 | 20,400 | 7,200 | 15,000 | 400 | -------- |
| Lines: | | | | | | | | | |
| Trot with baits or snoods | -------- | 41 | 1 | 12 | 4 | -------- | 12 | 228 | 54 |
| Baits or snoods | -------- | 14,350 | 300 | 3,600 | 1,600 | -------- | 4,800 | 114,000 | 37,800 |
| Trot with hooks | -------- | -------- | 2 | -------- | -------- | -------- | -------- | -------- | -------- |
| Hooks | -------- | -------- | 2,000 | -------- | -------- | -------- | -------- | -------- | -------- |
| Pound nets | -------- | 7 | -------- | 33 | 13 | -------- | 42 | 58 | 33 |
| Crab pound nets | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 80 | -------- |
| Stop nets | 2 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Square yards | 1,300 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Fyke nets | 14 | -------- | 105 | 8 | 56 | 22 | 20 | 8 | 7 |
| Dip nets | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 50 | -------- |
| Otter trawls | -------- | -------- | -------- | -------- | -------- | -------- | 1 | -------- | 10 |
| Yards at mouth | -------- | -------- | -------- | -------- | -------- | -------- | 25 | -------- | 257 |
| Pots: | | | | | | | | | |
| Eel | -------- | -------- | -------- | -------- | 210 | -------- | 100 | 230 | -------- |
| Fish | 55 | -------- | -------- | -------- | -------- | 29 | 60 | -------- | -------- |
| Dredges: | | | | | | | | | |
| Crab | -------- | -------- | -------- | -------- | -------- | -------- | 2 | -------- | 92 |
| Yards at mouth | -------- | -------- | -------- | -------- | -------- | -------- | 4 | -------- | 177 |
| Oyster | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 6 |
| Yards at mouth | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 9 |
| Tongs: | | | | | | | | | |
| Oyster | -------- | 4 | -------- | 34 | -------- | -------- | 60 | 258 | 117 |
| Other | -------- | 4 | -------- | -------- | -------- | -------- | 30 | -------- | 10 |

*Fisheries of Virginia, 1937*—Continued

CATCH: BY COUNTIES

| Species | Accomac | | Arlington | | Caroline | | Charles City | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 1,327,900 | $10,821 | | | | | 1,500 | $30 |
| Bluefish | 64,200 | 5,913 | | | | | | |
| Bonito | 4,300 | 216 | | | | | | |
| Butterfish | 227,800 | 4,556 | | | | | | |
| Carp | | | 79,000 | $1,580 | 100 | $3 | 18,200 | 367 |
| Catfish and bullheads | | | 9,500 | 285 | 500 | 18 | 126,200 | 6,230 |
| Croaker | 2,565,700 | 39,103 | | | | | | |
| Drum: | | | | | | | | |
| Black | 9,200 | 120 | | | | | | |
| Red or redfish | 10,100 | 237 | | | | | | |
| Eels, common | 20,400 | 2,719 | 1,600 | 80 | | | 3,500 | 175 |
| Flounders | 36,600 | 2,228 | | | | | | |
| Gizzard shad | | | | | | | 5,100 | 75 |
| Harvestfish | 4,000 | 80 | | | | | | |
| Hickory shad | 800 | 14 | | | | | 400 | 16 |
| King whiting or "kingfish" | 3,600 | 112 | | | | | | |
| Menhaden | 631,000 | 2,417 | | | | | | |
| Scup | 56,200 | 1,541 | | | | | | |
| Sea bass | 67,200 | 2,016 | | | | | | |
| Shad | 100,000 | 9,194 | 5,800 | 633 | 200 | 25 | 33,000 | 2,554 |
| Sharks | 2,000 | 60 | | | | | | |
| Skates | 600 | 3 | | | | | | |
| Spanish mackerel | 15,500 | 471 | | | | | | |
| Spot | 312,500 | 6,150 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 1,485,500 | 37,214 | | | | | | |
| Spotted | 16,800 | 840 | | | | | | |
| Striped bass | 58,800 | 2,940 | 2,200 | 198 | | | 8,800 | 440 |
| Sturgeon | 200 | 30 | | | | | 100 | 15 |
| Suckers | | | 300 | 6 | | | | |
| White perch | 3,700 | 74 | 1,800 | 36 | 300 | 18 | 3,900 | 195 |
| Yellow perch | | | 1,500 | 60 | | | 800 | 40 |
| Crabs: | | | | | | | | |
| Hard | 4,313,500 | 78,561 | | | | | | |
| Soft and peelers | 1,075,600 | 86,040 | | | | | | |
| Clams, hard, public | 673,500 | 122,065 | | | | | | |
| Mussels, sea | 27,700 | 788 | | | | | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 129,600 | 9,970 | | | | | | |
| Public, fall | 720,000 | 50,050 | | | | | | |
| Private, spring | 276,000 | 21,200 | | | | | | |
| Private, fall | 488,400 | 37,380 | | | | | | |
| Squid | 13,800 | 207 | | | | | | |
| Total | 14,742,700 | 535,330 | 101,700 | 2,878 | 1,100 | 64 | 201,500 | 10,137 |

| Species | Chesterfield | | Dinwiddie | | Elizabeth City | | Essex | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 18,200 | $273 | 3,500 | $70 | 653,800 | $6,538 | 9,000 | $180 |
| Bluefish | | | | | 74,100 | 2,310 | | |
| Bonito | | | | | 1,200 | 50 | | |
| Butterfish | | | | | 164,200 | 2,759 | | |
| Cabio or crab eater | | | | | 5,000 | 200 | | |
| Carp | 19,300 | 712 | | | | | 6,600 | 198 |
| Catfish and bullheads | 10,100 | 504 | 6,700 | 385 | 500 | 15 | 4,000 | 200 |
| Cod | | | | | 200 | 4 | | |
| Croaker | | | | | 3,928,500 | 63,005 | | |
| Drum: | | | | | | | | |
| Black | | | | | 3,900 | 39 | | |
| Red or redfish | | | | | 6,900 | 77 | | |
| Eels: | | | | | | | | |
| Common | 200 | 16 | 300 | 18 | 1,000 | 50 | 1,400 | 70 |
| Conger | | | | | 200 | 3 | | |
| Flounders | | | | | 88,800 | 5,045 | | |
| Gizzard shad | 1,500 | 15 | 6,000 | 120 | 18,300 | 208 | 11,900 | 119 |
| Hake | | | | | 100 | 2 | | |
| Harvestfish | | | | | 269,200 | 4,038 | | |
| Hickory shad | 2,200 | 33 | | | 16,100 | 322 | | |
| King whiting or "kingfish" | | | | | 20,900 | 670 | | |
| Pompano | | | | | 5,600 | 560 | | |

## *Fisheries of Virginia, 1937*—Continued

CATCH: BY COUNTIES—Continued

| Species | Chesterfield | | Dinwiddie | | Elizabeth City | | Essex | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Scup | | | | | 773,000 | $11,552 | | |
| Sea bass | | | | | 55,400 | 2,984 | | |
| Sea robbin | | | | | 200 | 3 | | |
| Shad | 7,500 | $771 | 200 | $24 | 259,500 | 22,148 | 1,400 | $168 |
| Sharks | | | | | 2,400 | 81 | | |
| Spanish mackerel | | | | | 106,400 | 2,168 | | |
| Spot | | | | | 249,800 | 4,939 | | |
| Squeteagues or "sea trout," gray | | | | | 1,863,300 | 29,922 | | |
| Striped bass | 100 | 7 | | | 82,200 | 5,310 | 1,200 | 120 |
| Sturgeon | 300 | 45 | | | 5,900 | 564 | | |
| Swellfish | | | | | 5,800 | 58 | | |
| Tautog | | | | | 100 | 2 | | |
| White perch | 1,400 | 42 | | | 12,200 | 244 | 7,600 | 380 |
| Whiting | | | | | 1,600 | 22 | | |
| Yellow perch | 200 | 8 | | | | | 200 | 14 |
| Crabs, hard | | | | | 1,165,400 | 33,728 | 24,500 | 735 |
| Clams, hard, public | | | | | 6,000 | 1,000 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | | | | | | | 24,000 | 1,800 |
| Public, fall | | | | | | | 36,000 | 2,700 |
| Private, spring | | | | | 23,900 | 2,642 | 60,000 | 4,500 |
| Private, fall | | | | | 760,900 | 59,039 | 72,000 | 5,400 |
| Scallops, sea | | | | | 10,800 | 1,426 | | |
| Squid | | | | | 11,600 | 170 | | |
| Total | 61,000 | 2,426 | 16,700 | 617 | 10,654,900 | 263,897 | 259,800 | 16,584 |

| Species | Fairfax | | Gloucester | | Henrico | | Isle of Wight | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 320,000 | $3,200 | 1,100 | $13 | 5,800 | $87 |
| Bluefish | | | 19,600 | 774 | | | | |
| Butterfish | | | 213,200 | 2,650 | | | | |
| Cabio or crab eater | | | 2,600 | 104 | | | | |
| Carp | 5,000 | $100 | | | 22,500 | 345 | 8,000 | 120 |
| Catfish and bullheads | 65,300 | 1,959 | 800 | 24 | 5,000 | 132 | 17,300 | 346 |
| Croaker | | | 5,567,100 | 83,506 | | | 12,500 | 247 |
| Drum: | | | | | | | | |
| Black | | | 1,000 | 10 | | | | |
| Red or redfish | | | 500 | 10 | | | | |
| Eels, common | 4,500 | 225 | | | | | | |
| Flounders | | | 28,400 | 1,126 | | | | |
| Gizzard shad | | | 1,200 | 12 | 7,500 | 75 | 2,000 | 20 |
| Hickory shad | | | 2,000 | 25 | | | | |
| King whiting or "kingfish" | | | 1,500 | 45 | | | | |
| Mullet | | | 600 | 18 | | | | |
| Pompano | | | 500 | 50 | | | | |
| Shad | 23,400 | 2,575 | 98,600 | 8,874 | 7,300 | 568 | 32,200 | 3,540 |
| Spanish mackerel | | | 40,000 | 900 | | | | |
| Spot | | | 193,300 | 3,866 | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | 874,900 | 13,126 | | | 2,000 | 40 |
| Spotted | | | 1,000 | 50 | | | | |
| Striped bass | 3,000 | 270 | 14,200 | 710 | 4,300 | 301 | 12,400 | 620 |
| White perch | 15,600 | 312 | 4,500 | 135 | 1,100 | 33 | | |
| Yellow perch | 26,800 | 1,340 | | | | | 5,400 | 118 |
| Crabs: | | | | | | | | |
| Hard | | | 1,179,900 | 31,073 | | | 600,000 | 12,000 |
| Soft and peelers | | | 11,300 | 900 | | | | |
| Clams, hard, public | | | 652,700 | 97,905 | | | | |
| Oysters, market: | | | | | | | | |
| Public, spring | | | 132,000 | 8,800 | | | 57,000 | 3,840 |
| Public, fall | | | 84,000 | 5,600 | | | 84,000 | 5,600 |
| Private, spring | | | 150,000 | 10,000 | | | 132,000 | 9,900 |
| Private, fall | | | 210,000 | 14,000 | | | 48,000 | 3,600 |
| Total | 143,600 | 6,781 | 9,805,400 | 287,493 | 48,800 | 1,467 | 1,018,600 | 40,078 |

## *Fisheries of Virginia, 1937*—Continued

CATCH: BY COUNTIES—Continued

| Species | James City | | King and Queen | | King George | | King William | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 300 | $6 | 4,700 | $47 | 9,200 | $94 |
| Carp | 22,000 | $465 | | | 27,800 | 556 | | |
| Catfish and bullheads | 39,800 | 1,154 | | | 53,200 | 1,584 | 100 | 4 |
| Eels, common | 1,200 | 42 | | | 4,100 | 211 | | |
| Gizzard shad | 13,000 | 170 | | | 56,900 | 569 | | |
| Hickory shad | | | | | | | 100 | 2 |
| Pike or pickerel | | | | | 300 | 30 | | |
| Shad | 43,800 | 4,533 | 25,600 | 2,816 | 19,300 | 1,600 | 15,700 | 1,767 |
| Squeteagues or "sea trout," gray | | | | | 1,300 | 26 | | |
| Striped bass | 15,100 | 756 | | | 93,100 | 7,447 | 800 | 64 |
| White perch | 3,200 | 97 | | | 18,300 | 525 | | |
| Yellow perch | 300 | 15 | | | 8,300 | 332 | | |
| Crabs, hard | | | | | 160,000 | 4,000 | 70,000 | 1,400 |
| Oysters, market: | | | | | | | | |
| Public, spring | 1,200 | 80 | | | | | 6,000 | 400 |
| Public, fall | 4,800 | 320 | 3,000 | 200 | | | 9,000 | 600 |
| Turtles, snapper | 1,500 | 22 | | | | | | |
| Total | 145,900 | 7,654 | 28,900 | 3,022 | 447,300 | 16,927 | 110,900 | 4,331 |

| Species | Lancaster | | Mathews | | Middlesex | | Nansemond | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 1,852,600 | $18,526 | 3,311,200 | $33,111 | 2,100 | $21 | | |
| Bluefish | 17,400 | 522 | 116,600 | 3,498 | 22,100 | 1,326 | | |
| Bonito | | | 7,100 | 213 | | | | |
| Butterfish | 62,600 | 1,252 | 263,100 | 3,950 | | | | |
| Cabio or crab eater | | | 10,000 | 300 | | | | |
| Carp | 600 | 9 | | | 23,500 | 320 | | |
| Catfish and bullheads | | | | | 5,900 | 148 | | |
| Croaker | 530,500 | 7,957 | 11,505,300 | 143,846 | 595,900 | 14,939 | 10,000 | $150 |
| Drum: | | | | | | | | |
| Black | | | 600 | 5 | | | | |
| Red or redfish | | | 1,200 | 12 | | | | |
| Eels, common | 500 | 40 | | | 100 | 10 | | |
| Flounders | 5,900 | 177 | 67,800 | 2,894 | 2,900 | 201 | | |
| Gizzard shad | 5,500 | 55 | 2,800 | 28 | 1,400 | 14 | 5,200 | 52 |
| Harvestfish | | | 112,300 | 1,685 | | | | |
| Hickory shad | 2,000 | 40 | 15,300 | 306 | | | | |
| Hogfish | | | 600 | 18 | | | | |
| King whiting or "kingfish" | | | 2,600 | 78 | 2,300 | 69 | | |
| Menhaden | 52,770,000 | 210,323 | 1,188,000 | 3,000 | | | | |
| Mullet | | | 4,000 | 120 | | | | |
| Scup | | | 35,600 | 373 | | | | |
| Sea bass | | | 1,000 | 50 | | | | |
| Shad | 338,800 | 32,676 | 1,183,000 | 102,361 | 400 | 60 | 2,100 | 227 |
| Skates | | | | | 15,800 | 158 | | |
| Spanish mackerel | 8,500 | 255 | 365,500 | 7,310 | | | | |
| Spot | 70,200 | 1,404 | 619,000 | 9,286 | 44,000 | 880 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 226,300 | 4,546 | 2,737,000 | 41,077 | 17,800 | 356 | 2,400 | 48 |
| Spotted | 5,500 | 275 | 20,200 | 1,212 | 10,500 | 735 | | |
| Striped bass | 50,000 | 3,185 | 35,600 | 1,780 | 34,200 | 2,047 | 5,000 | 250 |
| Sturgeon | | | 2,100 | 131 | | | | |
| White perch | 2,600 | 39 | 11,800 | 354 | 4,800 | 212 | | |
| Whiting | | | 1,200 | 12 | | | | |
| Yellow perch | | | | | | | 2,100 | 42 |
| Crabs: | | | | | | | | |
| Hard | 3,420,000 | 52,500 | 1,719,100 | 44,743 | 1,251,700 | 23,511 | 87,500 | 1,750 |
| Soft and peelers | 236,000 | 28,600 | 92,500 | 9,250 | 103,200 | 10,865 | | |
| Clams, hard, public | | | 4,000 | 800 | | | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 222,000 | 14,800 | 10,800 | 720 | 318,000 | 21,200 | 5,000 | 400 |
| Public, fall | 330,000 | 22,000 | 6,000 | 400 | 246,000 | 16,400 | 5,000 | 400 |
| Private, spring | 258,000 | 20,400 | 43,100 | 3,180 | 228,000 | 15,200 | 75,000 | 6,000 |
| Private, fall | 342,000 | 22,800 | 119,400 | 8,603 | 186,000 | 12,400 | 75,000 | 6,000 |
| Squid | | | 1,900 | 39 | | | | |
| Total | 60,757,500 | 442,431 | 23,617,300 | 424,745 | 3,116,600 | 121,072 | 274,300 | 15,319 |

*Fisheries of Virginia, 1937*—Continued

CATCH: BY COUNTIES—Continued

| Species | New Kent | | Norfolk | | Northampton | | Northumberland | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 41,700 | $637 | 73,000 | $730 | 307,600 | $3,076 | 6,630,900 | $66,309 |
| Bluefish | | | 16,900 | 1,379 | 41,000 | 1,193 | 19,100 | 762 |
| Bonito | | | 2,600 | 130 | 500 | 30 | 400 | 36 |
| Butterfish | | | 309,700 | 3,511 | 183,000 | 3,660 | 14,800 | 296 |
| Cabio or crab eater | | | | | 1,100 | 55 | | |
| Carp | 800 | 12 | | | | | 16,500 | 483 |
| Catfish and bullheads | 22,700 | 895 | | | | | 200 | 10 |
| Croaker | | | 1,479,100 | 32,573 | 1,092,300 | 16,275 | 533,000 | 7,429 |
| Drum: | | | | | | | | |
| Black | | | | | 900 | 9 | | |
| Red or redfish | | | 3,100 | 76 | 3,200 | 49 | 4,500 | 50 |
| Eels: | | | | | | | | |
| Common | 1,300 | 92 | | | 28,500 | 4,275 | 8,600 | 522 |
| Conger | | | 200 | 4 | | | | |
| Flounders | 100 | 8 | 37,500 | 2,639 | 109,700 | 4,412 | 17,300 | 581 |
| Gizzard shad | 8,000 | 80 | | | | | 9,700 | 97 |
| Grayfish | | | 5,400 | 170 | | | | |
| Hake | | | 300 | 7 | | | | |
| Harvestfish | | | 11,500 | 230 | 649,000 | 12,980 | 5,000 | 100 |
| Hickory shad | | | 8,500 | 170 | | | 26,800 | 536 |
| King whiting or "kingfish" | | | 19,800 | 644 | 5,400 | 217 | | |
| Mackerel | | | | | 98,600 | 1,988 | | |
| Menhaden | | | | | 5,000 | 49 | 67,321,000 | 268,915 |
| Mullet | | | 1,000 | 30 | 4,000 | 60 | | |
| Pompano | | | 300 | 36 | 300 | 30 | | |
| Scup | | | 604,300 | 9,321 | 5,500 | 186 | | |
| Sea bass | | | 25,000 | 1,306 | 8,100 | 212 | | |
| Sea robin | | | 2,600 | 41 | | | | |
| Shad | 17,100 | 1,824 | 60,500 | 6,051 | 3,900 | 335 | 588,300 | 52,946 |
| Snapper, red | | | 100 | 4 | | | | |
| Spanish mackerel | | | 175,200 | 4,380 | 34,000 | 685 | 18,900 | 548 |
| Spot | | | 288,500 | 5,769 | 252,600 | 3,902 | 17,200 | 344 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 200 | 7 | 513,100 | 11,464 | 3,253,000 | 65,065 | 384,900 | 6,867 |
| Spotted | | | 2,700 | 162 | 6,000 | 300 | 4,000 | 210 |
| Striped bass | 10,900 | 1,083 | 300 | 24 | 17,600 | 901 | 211,600 | 11,678 |
| Sturgeon | | | 1,800 | 266 | | | 200 | 30 |
| Swellfish | | | 1,700 | 23 | | | | |
| White perch | 2,100 | 156 | 4,200 | 109 | 2,000 | 30 | 6,300 | 68 |
| Whiting | | | 3,700 | 52 | | | | |
| Yellow perch | 200 | 16 | | | | | | |
| Crabs: | | | | | | | | |
| Hard | 5,900 | 295 | 282,100 | 5,883 | 1,530,000 | 27,555 | 6,501,900 | 102,268 |
| Soft and peelers | | | | | 382,500 | 30,800 | 524,200 | 52,460 |
| Clams, hard, public | | | | | 156,200 | 23,430 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | | | | | | | 60,000 | 4,000 |
| Public, fall | | | | | | | 108,000 | 7,200 |
| Private, spring | | | 178,300 | 16,028 | 593,500 | 38,380 | 234,000 | 15,600 |
| Private, fall | | | 1,188,600 | 89,231 | 889,000 | 57,150 | 270,000 | 18,000 |
| Squid | | | 9,600 | 190 | 71,700 | 1,434 | | |
| Total | 111,000 | 5,105 | 5,311,200 | 192,633 | 9,735,700 | 298,723 | 83,537,300 | 618,345 |

| Species | Prince George | | Princess Anne | | Prince William | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 2,400 | $48 | 3,500 | $46 | | |
| Bluefish | | | 47,300 | 2,342 | | |
| Bonito | | | 1,500 | 33 | | |
| Butterfish | | | 482,800 | 5,187 | | |
| Carp | 43,600 | 872 | | | 30,000 | $600 |
| Catfish and bullheads | 52,800 | 2,112 | | | 27,900 | 729 |
| Croaker | | | 517,300 | 8,420 | | |
| Drum, red or redfish | | | 9,200 | 183 | | |
| Eels, common | 3,000 | 180 | | | 800 | 40 |
| Flounders | | | 5,800 | 426 | | |
| Gizzard shad | 3,600 | 72 | | | 3,000 | 30 |
| Harvestfish | | | 14,000 | 304 | | |
| Hickory shad | | | 400 | 8 | | |
| King whiting or "kingfish" | | | 43,400 | 1,262 | | |
| Mackerel | | | 2,100 | 43 | | |
| Mullet | | | 1,800 | 54 | | |
| Pompano | | | 3,200 | 192 | | |
| Scup | | | 100 | 2 | | |
| Shad | 7,300 | 730 | 2,500 | 262 | 6,300 | 615 |
| Sheepshead | | | 100 | 2 | | |

## *Fisheries of Virginia, 1937*—Continued

CATCH: BY COUNTIES—Continued

| Species | Prince George | | Princess Anne | | Prince William | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Spanish mackerel | | | 33,500 | $1,095 | | |
| Spot | | | 582,400 | 10,889 | | |
| Squeteagues or "sea trout": | | | | | | |
| Gray | | | 264,000 | 3,706 | | |
| Spotted | | | 10,100 | 707 | | |
| Striped bass | 2,500 | $125 | 3,000 | 240 | 53,400 | $3,738 |
| White perch | 1,300 | 39 | 1,700 | 51 | 13,900 | 280 |
| Yellow perch | 200 | 8 | | | 4,700 | 235 |
| Crabs, hard | | | 328,000 | 5,740 | 5,000 | 175 |
| Clams, hard, private | | | 7,000 | 1,750 | | |
| Oysters, market, private, fall | | | 14,000 | 1,000 | | |
| Total | 116,700 | 4,186 | 2,378,700 | 43,944 | 145,000 | 6,442 |

| Species | Richmond | | Stafford | | Surry | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 20,200 | $202 | 2,000 | $20 | | |
| Carp | 7,000 | 140 | 38,700 | 774 | 4,500 | $65 |
| Catfish and bullheads | 22,400 | 672 | 61,100 | 1,833 | 21,200 | 574 |
| Croaker | 2,900 | 58 | | | 300 | 6 |
| Eels, common | 6,200 | 310 | 32,000 | 1,605 | | |
| Flounders | 200 | 10 | | | | |
| Gizzard shad | 20,900 | 209 | 25,700 | 257 | 2,300 | 23 |
| Hickory shad | 1,800 | 36 | | | | |
| Shad | 12,400 | 1,180 | 25,500 | 2,800 | 4,400 | 485 |
| Spot | 1,000 | 20 | | | | |
| Squeteagues or "sea trout," gray | 3,400 | 68 | | | 1,100 | 22 |
| Striped bass | 15,400 | 924 | 87,000 | 7,866 | 10,100 | 505 |
| White perch | 11,700 | 351 | 16,500 | 330 | 1,500 | 40 |
| Yellow perch | 1,200 | 60 | 24,700 | 1,235 | | |
| Crabs, hard | 30,000 | 750 | 28,000 | 1,120 | | |
| Oysters, market: | | | | | | |
| Public, spring | 54,000 | 4,050 | | | | |
| Public, fall | 84,000 | 6,300 | | | | |
| Private, spring | 36,000 | 2,700 | | | | |
| Private, fall | 60,000 | 4,500 | | | | |
| Total | 390,700 | 22,540 | 341,200 | 17,840 | 45,400 | 1,720 |

| Species | Warwick | | Westmoreland | | York | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 69,600 | $696 | 383,500 | $3,000 | 9,000 | $90 |
| Bluefish | 7,700 | 308 | 11,800 | 472 | 70,700 | 2,388 |
| Bonito | | | | | 600 | 24 |
| Butterfish | 7,700 | 153 | 500 | 10 | 27,000 | 715 |
| Cabio or crab eater | | | | | 1,400 | 56 |
| Carp | 5,300 | 53 | 14,700 | 253 | | |
| Catfish and bullheads | 30,700 | 921 | 23,200 | 734 | | |
| Cod | | | | | 700 | 13 |
| Croaker | 251,200 | 5,507 | 76,500 | 1,148 | 4,443,600 | 73,994 |
| Drum: | | | | | | |
| Black | 1,000 | 7 | | | | |
| Red or redfish | 1,700 | 19 | | | 2,900 | 55 |
| Eels, common | 1,200 | 96 | 5,100 | 408 | | |
| Flounders | 14,500 | 710 | 100 | 4 | 84,400 | 5,432 |
| Gizzard shad | 5,600 | 56 | 21,500 | 215 | | |
| Hake | | | | | 100 | 1 |
| Harvestfish | 25,000 | 375 | 500 | 10 | | |
| Hickory shad | 4,800 | 144 | 2,900 | 87 | 500 | 7 |
| King whiting or "kingfish" | 3,500 | 105 | | | 32,800 | 992 |
| Menhaden | 50,000 | 200 | | | | |
| Pompano | 1,200 | 120 | | | | |
| Scup | 162,700 | 1,731 | | | 294,000 | 6,302 |
| Sea bass | 8,500 | 387 | | | 32,300 | 1,631 |
| Shad | 74,900 | 1,550 | 40,000 | 3,409 | 44,900 | 3,772 |
| Sharks | | | | | 1,800 | 66 |
| Spanish mackerel | 1,500 | 45 | 2,500 | 75 | 4,000 | 75 |
| Spot | 10,600 | 206 | 12,600 | 252 | 324,800 | 6,752 |
| Squeteagues or "sea trout": | | | | | | |
| Gray | 77,600 | 1,523 | 319,500 | 4,793 | 579,400 | 13,372 |
| Spotted | | | | | 63.800 | 2,551 |
| Striped bass | 55,200 | 2,760 | 98,700 | 5,012 | 17,800 | 1,456 |

## *Fisheries of Virginia, 1937*—Continued

### CATCH: By counties—continued

| Species | Warwick | | Westmoreland | | York | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Sturgeon | 600 | $69 | | | 1,500 | $205 |
| Swellfish | | | | | 900 | 36 |
| Tautog | | | | | 200 | 9 |
| Tomcod | | | | | 100 | 1 |
| White perch | 7,500 | 112 | 27,400 | $822 | 6,500 | 99 |
| Whiting | 3,400 | 34 | | | 7,300 | 74 |
| Crabs: | | | | | | |
| Hard | 153,000 | 2,355 | 1,646,000 | 28,805 | 3,426,000 | 106,055 |
| Soft and peelers | | | 50,000 | 6,000 | | |
| Shrimp | | | | | 1,700 | 120 |
| Clams, hard, public | 25,000 | 4,800 | | | 106,700 | 19,032 |
| Oysters, market: | | | | | | |
| Public, spring | 30,000 | 2,400 | 210,000 | 14,000 | 25,000 | 2,000 |
| Public, fall | 35,000 | 2,800 | 300,000 | 20,000 | 50,000 | 4,000 |
| Private, spring | | | 60,000 | 4,000 | | |
| Private, fall | | | 30,000 | 2,000 | 495,500 | 37,287 |
| Squid | | | | | 3,300 | 61 |
| Total | 1,126,200 | 30,242 | 3,337,000 | 95,509 | 10,161,200 | 288,723 |

### SEED OYSTER FISHERY: By gear

| Item | Tongs | |
|---|---|---|
| OPERATING UNITS | | |
| Fishermen: | *Number* | |
| On vessels | 37 | |
| On boats and shore: | | |
| Regular | 1,051 | |
| Casual | 132 | |
| Total | 1,220 | |
| Vessels, motor | 13 | |
| Net tonnage | 69 | |
| Boats: | | |
| Motor | 433 | |
| Other | 33 | |
| Apparatus, number | 910 | |
| CATCH | | |
| Oysters, seed: | *Bushels* | *Value* |
| Public, spring | 249,900 | $62,479 |
| Public, fall | 544,200 | 136,006 |
| Private, fall | 2,400 | 600 |
| Total | 796,500 | 199,085 |

### SEED OYSTER FISHERY: By counties

| Item | Elizabeth City | | Gloucester | | Isle of Wight | | Mathews | |
|---|---|---|---|---|---|---|---|---|
| OPERATING UNITS | | | | | | | | |
| Fishermen: | *Number* | | *Number* | | *Number* | | *Number* | |
| On vessels | | | 16 | | | | | |
| On boats and shore: | | | | | | | | |
| Regular | 28 | | 275 | | 250 | | 15 | |
| Casual | | | | | 42 | | | |
| Total | 28 | | 291 | | 292 | | 15 | |
| Vessels, motor | | | 6 | | | | | |
| Net tonnage | | | 31 | | | | | |
| Boats: | | | | | | | | |
| Motor | 9 | | 87 | | 114 | | 5 | |
| Other | | | | | 15 | | | |
| Apparatus, tongs | 19 | | 187 | | 242 | | 10 | |
| CATCH | | | | | | | | |
| Oysters, seed: | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* |
| Public, spring | 3,300 | $817 | 34,900 | $8,725 | 80,300 | $20,086 | 1,700 | $430 |
| Public, fall | 7,000 | 1,752 | 71,800 | 17,943 | 177,400 | 44,346 | 3,700 | 922 |
| Total | 10,300 | 2,569 | 106,700 | 26,668 | 257,700 | 64,432 | 5,400 | 1,352 |

*Fisheries of Virginia, 1937*—Continued

SEED OYSTER FISHERY: BY COUNTIES—Continued

| Item | Nansemond | | Norfolk | | Warwick | | York | |
|---|---|---|---|---|---|---|---|---|
| OPERATING UNITS | | | | | | | | |
| Fishermen: | *Number* | | *Number* | | *Number* | | *Number* | |
| On vessels | 21 | | | | | | | |
| On boats and shore: | | | | | | | | |
| Regular | 153 | | 28 | | 170 | | 132 | |
| Casual | 20 | | | | 50 | | 20 | |
| Total | 194 | | 28 | | 220 | | 152 | |
| Vessels, motor | 7 | | | | | | | |
| Net tonnage | 38 | | | | | | | |
| Boats: | | | | | | | | |
| Motor | 65 | | 12 | | 85 | | 56 | |
| Other | 5 | | | | | | 13 | |
| Apparatus, tongs | 142 | | 23 | | 170 | | 117 | |
| CATCH | | | | | | | | |
| Oysters, seed: | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* |
| Public, spring | 47,400 | $11,854 | 4,000 | $989 | 56,400 | $14,110 | 21,900 | $5,468 |
| Public, fall | 101,200 | 25,263 | 8,500 | 2,121 | 124,600 | 31,152 | 50,000 | 12,507 |
| Private, fall | 2,400 | 600 | | | | | | |
| Total | 151,000 | 37,717 | 12,500 | 3,110 | 181,000 | 45,262 | 71,900 | 17,975 |

NOTE.—Of the total number of persons fishing for seed oysters, 815 are duplicated among those fishing for market oysters or other species. Similarly, the following craft and gear are duplicated: 295 motorboats, 21 other boats, and 606 tongs.

## SHAD AND ALEWIFE FISHERIES OF THE POTOMAC RIVER

The catch of shad in the Potomac River in 1937 amounted to 164,093 in number, 434,900 pounds in weight, and their total value to the fishermen was $40,332. The catch of alewives for the same season amounted to 7,567,500 in number, with a total weight of 3,025,200 pounds, and a value to the fishermen of $29,143. These figures show an increase of 21 percent in the weight and 14 percent in the value of shad as compared with 1936, and a decrease of 33 percent in weight and 21 percent in the value of alewives.

Approximately 79 percent of the shad, in weight, were taken with pound nets, and 21 percent with gill nets. More than 99 percent of the alewives were taken with pound nets, only a small quantity being taken with gill nets.

Statistics of the catch of shad and alewives in the Potomac River are also included in the catch data for Maryland and Virginia which are published elsewhere in this report.

*Shad and Alewife fisheries of the Potomac River, 1937*

| Item | Maryland | | | Virginia | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | *Number* | *Pounds* | *Value* | *Number* | *Pounds* | *Value* | *Number* | *Pounds* | *Value* |
| Fishermen on boats and shore: | | | | | | | | | |
| Regular | 32 | | | 160 | | | 192 | | |
| Casual | 39 | | | 221 | | | 260 | | |
| Total | 71 | | | 381 | | | 452 | | |
| Boats: | | | | | | | | | |
| Motor | 25 | | | 118 | | | 143 | | |
| Other | 17 | | | 149 | | | 166 | | |
| Apparatus: | | | | | | | | | |
| Gill nets: | | | | | | | | | |
| Drift | 7 | | | 33 | | | | | |
| Square yards | 10,229 | | | 46,080 | | | | | |
| Stake | 618 | | | 2,454 | | | | | |
| Square yards | 48,970 | | | 46,740 | | | | | |
| Pound nets | 33 | | | 228 | | | 261 | | |

*Shad and Alewife fisheries of the Potomac River, 1937*—Continued

| Item | Maryland | | | Virginia | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | *Number* | *Pounds* | *Value* | *Number* | *Pounds* | *Value* | *Number* | *Pounds* | *Value* |
| Shad caught: | | | | | | | | | |
| With drift gill nets | 4, 802 | 13, 200 | $1, 101 | 10, 860 | 30, 100 | $3, 280 | 15, 662 | 43, 300 | $4, 381 |
| With stake gill nets | 1, 694 | 5, 100 | 684 | 16, 267 | 42, 000 | 4, 392 | 17, 961 | 47, 100 | 5, 076 |
| With pound nets | 9, 240 | 25, 200 | 2, 319 | 121, 230 | 319, 300 | 28, 556 | 130, 470 | 344, 500 | 30, 875 |
| Total | 15, 736 | 43, 500 | 4, 104 | 148, 357 | 391, 400 | 36. 228 | 164, 093 | 434, 900 | 40, 332 |
| Alewives caught: | | | | | | | | | |
| With stake gill nets | -------- | -------- | ------ | 5, 000 | 2, 000 | 20 | 5, 000 | 2, 000 | 20 |
| With pound nets | 519, 750 | 207, 900 | 1, 805 | 7, 042, 750 | 2, 815, 300 | 27, 318 | 7, 562, 500 | 3, 023, 200 | 29, 123 |
| Total | 519, 750 | 207, 900 | 1, 805 | 7, 047, 750 | 2, 817, 300 | 27, 338 | 7, 567, 500 | 3, 025, 200 | 29, 143 |

## TRADE IN FISHERY PRODUCTS IN WASHINGTON, D. C.

The municipal fish wharf and market in Washington, D. C., is located in the southwestern part of the city on an arm of the Potomac River. At the present time 16 firms have stalls in this market, 2 are located in the immediate vicinity of the market, 2 have stalls in the Center Market, located at Fifth and K Streets NW., and 3 are located in other parts of the city. Altogether there are 23 firms which employ 156 persons who received $141,327 in salaries and wages during 1937. These firms conduct mainly a wholesale business although some retail trade is carried on. In 1937 manufactured products produced by firms in Washington, D. C., consisted of smoked fish and shucked oysters. The total value of these products amounted to $10,225.

The facilities for handling fish and oysters from boats and vessels that may land at the wharf are good, but only a comparatively small quantity are brought into the city by this method. In the fall and winter considerable quantities of shell oysters are landed, but most of the oysters handled in Washington are brought in already shucked from Maryland and Virginia by trucks and other transportation facilities.

## FISHERIES OF THE SOUTH ATLANTIC AND GULF STATES

(South Atlantic, Area XXIV; Gulf, Area XXV) [8]

The yield of the commercial fisheries of the marine areas of the South Atlantic and Gulf States (North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas) during 1937 amounted to 546,751,000 pounds, valued at $14,226,370 to the fishermen, representing a decrease of 2 percent in quantity, but an increase of 5 percent in value as compared with the catch of the previous year. These fisheries provided employment for 30,244 fishermen as compared with 29,006 in 1936.

There were 725 fishery wholesale and manufacturing establishments in these States in 1937, which was 22 more than indicated by the survey in 1936. In 1937 these establishments employed 18,534 persons, paid $3,863,777 in salaries and wages, and produced manufactured products (canned, cured, packaged, and byproducts) valued at

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[8] These are the numbers given to these areas by the North American Council on Fishery Investigations. The catch of the Mississippi River and tributaries is not included in this section. For a clearer understanding of the statistics published in this section the reader is referred to the section in the latter part of this document entitled "Statistical survey procedure."

$15,110,653. In 1936 wholesale and manufacturing firms employed 17,095 persons, paid $3,296,241 in salaries and wages and produced manufactured products valued at $11,445,674.

*Fisheries of the South Atlantic and Gulf States, 1937*

SUMMARY OF CATCH

| Product | North Carolina | | South Carolina | | Georgia | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Fish | 102, 749, 300 | $1, 300, 512 | 1, 905, 700 | $106, 347 | 10, 431, 800 | $73, 414 |
| Shellfish, etc | 10, 005, 700 | 357, 779 | 5, 259, 900 | 161, 361 | 12, 010, 800 | 332, 162 |
| Total | 112, 755, 000 | 1, 658, 291 | 7, 165, 600 | 267, 708 | 22, 442, 600 | 405, 576 |

| Product | Florida | | Alabama | | Mississippi | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Fish | 210, 258, 900 | $3, 153, 575 | 5, 812, 800 | $244, 974 | 1, 190, 600 | $66, 097 |
| Shellfish, etc | 21, 916, 500 | 1, 897, 405 | 5, 104, 300 | 216, 396 | 37, 889, 300 | 1, 665, 118 |
| Total | 232, 175, 400 | 5, 050, 980 | 10, 917, 100 | 461, 370 | 39, 079, 900 | 1, 731, 215 |

| Product | Louisiana | | Texas | | Total | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Fish | 5, 131, 300 | $319, 961 | 6, 189, 000 | $383, 433 | 343, 669, 400 | $5, 648, 313 |
| Shellfish, etc | 91, 879, 100 | 3, 281, 224 | 19, 016, 000 | 666, 612 | 203, 081, 600 | 8, 578, 057 |
| Total | 97, 010, 400 | 3, 601, 185 | 25, 205, 000 | 1, 050, 045 | 546, 751, 000 | 14, 226, 370 |

OPERATING UNITS: BY STATES

| Item | North Carolina | South Carolina | Georgia | Florida | Alabama | Mississippi | Louisiana | Texas | Total |
|---|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 900 | 52 | 187 | 1, 369 | 168 | 983 | 502 | 161 | 4, 322 |
| On boats and shore: | | | | | | | | | |
| Regular | 3, 759 | 635 | 702 | 5, 853 | 653 | 1, 670 | 5, 565 | 1, 382 | 20, 219 |
| Casual | 1, 960 | 613 | 543 | 1, 372 | 110 | 116 | 693 | 296 | 5, 703 |
| Total | 6, 619 | 1, 300 | 1, 432 | 8, 494 | 931 | 2, 769 | 6, 760 | 1, 839 | 30, 244 |
| Vessels: | | | | | | | | | |
| Motor | 153 | 14 | 68 | 261 | 38 | 233 | 206 | 53 | 1, 026 |
| Net tonnage | 1, 549 | 158 | 572 | 1, 307 | 494 | 2, 831 | 1, 567 | 535 | 12, 013 |
| Sail | 61 | 1 | | | | 7 | | | 69 |
| Net tonnage | 549 | 12 | | | | 84 | | | 645 |
| Total vessels | 214 | 15 | 68 | 261 | 38 | 240 | 206 | 53 | 1, 095 |
| Total net tonnage | 2, 098 | 170 | 572 | 4, 307 | 494 | 2, 915 | 1, 567 | 535 | 12, 658 |
| Boats: | | | | | | | | | |
| Motor | 1, 339 | 55 | 227 | 2, 331 | 264 | 605 | 2, 468 | 624 | 7, 913 |
| Other | 1, 818 | 668 | 548 | 3, 196 | 412 | 633 | 1, 712 | 294 | 9, 281 |
| Accessory boats | 122 | 12 | 6 | 61 | | | 15 | | 216 |
| Apparatus: | | | | | | | | | |
| Purse seines: | | | | | | | | | |
| Menhaden | 24 | | 2 | 20 | | | | | 46 |
| Length, yards | 5, 857 | | 600 | 5, 670 | | | | | 12, 127 |
| Other | 2 | | | | | | | | 2 |
| Length, yards | 400 | | | | | | | | 400 |
| Haul seines: | | | | | | | | | |
| Common | 585 | 39 | 11 | 277 | 6 | 12 | 131 | 44 | 1, 105 |
| Length, yards | 111, 425 | 5, 920 | 992 | 156, 745 | 3, 500 | 4, 800 | 27, 570 | 15, 150 | 326, 102 |
| Long | 81 | | | | | | | | 81 |
| Length, yards | 80, 500 | | | | | | | | 80, 500 |

*Fisheries of the South Atlantic and Gulf States, 1937*—Continued

OPERATING UNITS: BY STATES—Continued

| Item | North Carolina | South Carolina | Georgia | Florida | Alabama | Mississippi | Louisiana | Texas | Total |
|---|---|---|---|---|---|---|---|---|---|
| Apparatus—Continued. | | | | | | | | | |
| Gill nets: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Anchor | 2,047 | 195 | 34 | 26 | ------- | ------- | ------- | ------- | 2,302 |
| Square yards | 1,010,040 | 139,900 | 1,530 | 22,380 | ------- | ------- | ------- | ------- | 1,173,850 |
| Drift | 128 | 33 | 159 | 93 | ------- | ------- | ------- | ------- | 413 |
| Square yards | 152,340 | 40,050 | 75,015 | 139,400 | ------- | ------- | ------- | ------- | 406,805 |
| Runaround | 565 | 51 | 34 | 2,161 | ------- | ------- | 1 | 131 | 2,943 |
| Square yards | 380,110 | 22,730 | 13,200 | 2,233,076 | ------- | ------- | 550 | 32,650 | 2,682,316 |
| Stake | 5,994 | 17 | 216 | 8 | 12 | ------- | ------- | 352 | 6,599 |
| Square yards | 429,930 | 11,304 | 21,904 | 7,600 | 2,525 | ------- | ------- | 84,090 | 557,353 |
| Trammel nets | ------- | ------- | ------- | 566 | 166 | 59 | 57 | 106 | 954 |
| Square yards | ------- | ------- | ------- | 557,400 | 82,400 | 29,850 | 12,760 | 57,700 | 740,110 |
| Lines: | | | | | | | | | |
| Hand | 117 | 123 | 310 | 1,889 | 124 | 120 | 332 | 362 | 3,377 |
| Hooks and baits | 134 | 222 | 310 | 2,522 | 203 | 149 | 347 | 441 | 4,328 |
| Trawl | ------- | ------- | ------- | 15 | ------- | ------- | ------- | ------- | 15 |
| Hooks | ------- | ------- | ------- | 800 | ------- | ------- | ------- | ------- | 800 |
| Troll | 32 | ------- | ------- | 993 | ------- | 6 | ------- | 7 | 1,038 |
| Hooks | 32 | ------- | ------- | 993 | ------- | 6 | ------- | 7 | 1,038 |
| Trot with baits or snoods | 673 | 98 | 232 | 212 | 102 | 173 | 876 | 49 | 2,415 |
| Baits or snoods | 442,900 | 49,200 | 99,250 | 95,900 | 29,900 | 101,600 | 220,550 | 14,700 | 1,054,000 |
| Trot with hooks | 15 | ------- | 91 | 237 | 279 | ------- | 550 | 77 | 1,249 |
| Hooks | 2,450 | ------- | 10,900 | 81,850 | 83,100 | ------- | 235,800 | 64,500 | 478,600 |
| Pound nets | 3,083 | ------- | ------- | 21 | ------- | ------- | ------- | ------- | 3,104 |
| Wheels | 10 | ------- | ------- | ------- | ------- | ------- | ------- | ------- | 10 |
| Fyke nets | 557 | ------- | ------- | 8 | 90 | ------- | 428 | ------- | 1,083 |
| Dip nets: | | | | | | | | | |
| Common | 469 | ------- | ------- | 83 | ------- | ------- | 65 | 34 | 651 |
| Drop | ------- | ------- | ------- | 26 | ------- | ------- | 8,925 | ------- | 8,951 |
| Cast nets | ------- | 25 | ------- | 232 | ------- | 41 | 160 | ------- | 458 |
| Otter trawls: | | | | | | | | | |
| Fish | 1 | 1 | ------- | 5 | ------- | ------- | ------- | ------- | 7 |
| Yards at mouth | 20 | 23 | ------- | 122 | ------- | ------- | ------- | ------- | 165 |
| Shrimp | 194 | 39 | 245 | 318 | 177 | 695 | 2,096 | 430 | 4,194 |
| Yards at mouth | 3,247 | 795 | 4,686 | 6,163 | 2,639 | 10,637 | 26,976 | 6,677 | 61,820 |
| Traps, brush | ------- | ------- | ------- | ------- | ------- | ------- | 28,300 | ------- | 28,300 |
| Pots: | | | | | | | | | |
| Crab | ------- | ------- | 655 | 5,783 | ------- | ------- | ------- | 800 | 7,238 |
| Eel | 1,412 | ------- | ------- | 90 | ------- | ------- | ------- | ------- | 1,502 |
| Fish | 54 | 76 | 84 | 4,920 | 655 | ------- | ------- | ------- | 5,789 |
| Sea crawfish | ------- | ------- | ------- | 2,075 | ------- | ------- | ------- | ------- | 2,075 |
| Turtle | 68 | ------- | ------- | ------- | ------- | ------- | ------- | ------- | 68 |
| Spears | 317 | 95 | ------- | 84 | 54 | 45 | ------- | 134 | 729 |
| Dredges: | | | | | | | | | |
| Clam | ------- | ------- | ------- | 1 | ------- | ------- | ------- | ------- | 1 |
| Oyster | 296 | 1 | ------- | 3 | 25 | 385 | 129 | 58 | 897 |
| Yards at mouth | 286 | 2 | ------- | 3 | 25 | 388 | 129 | 60 | 893 |
| Scallop | ------- | ------- | ------- | 37 | ------- | ------- | ------- | ------- | 37 |
| Yards at mouth | ------- | ------- | ------- | 27 | ------- | ------- | ------- | ------- | 27 |
| Tongs, oyster | 120 | ------- | 27 | 315 | 244 | 621 | 827 | 110 | 2,264 |
| Rakes: | | | | | | | | | |
| Oyster | ------- | ------- | ------- | 1 | ------- | ------- | ------- | ------- | 1 |
| Other | 1,108 | ------- | ------- | ------- | ------- | ------- | ------- | ------- | 1,108 |
| Forks | ------- | ------- | ------- | 9 | ------- | ------- | ------- | ------- | 9 |
| Grabs | ------- | 135 | 35 | 11 | ------- | ------- | ------- | ------- | 181 |
| Coquina scoops | ------- | ------- | ------- | 2 | ------- | ------- | ------- | ------- | 2 |
| Hooks: | | | | | | | | | |
| Conch | ------- | ------- | ------- | 3 | ------- | ------- | ------- | ------- | 3 |
| Sponge | ------- | ------- | ------- | 256 | ------- | ------- | ------- | ------- | 256 |
| Diving outfits | ------- | ------- | ------- | 72 | ------- | ------- | ------- | ------- | 72 |

*Fisheries of the South Atlantic and Gulf States, 1937*—Continued

CATCH: BY STATES

| Species | North Carolina | | South Carolina | | Georgia | |
|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 5,817,700 | $58,461 | | | | |
| Bluefish | 1,657,000 | 82,011 | 29,800 | $2,363 | | |
| Bonito | 900 | 14 | | | | |
| Bowfin | 3,100 | 38 | | | | |
| Butterfish | 13,400 | 370 | 200 | 6 | | |
| Carp | 324,200 | 6,923 | | | | |
| Catfish and bullheads | 653,300 | 18,478 | 51,000 | 1,865 | 90,500 | $4,675 |
| Cero | 200 | 8 | | | | |
| Croaker | 9,987,900 | 118,349 | 900 | 16 | 3,000 | 120 |
| Drum: | | | | | | |
| Black | 34,600 | 952 | 34,000 | 1,280 | 7,000 | 280 |
| Red or redfish | 441,200 | 14,777 | 118,500 | 6,255 | 37,500 | 1,960 |
| Eels, common | 91,100 | 2,539 | | | 4,000 | 480 |
| Flounders | 403,800 | 20,190 | 57,700 | 5,173 | 14,100 | 705 |
| Gizzard shad | 37,700 | 377 | | | | |
| Grunts | | | 5,000 | 150 | | |
| Harvestfish or "starfish" | 640,900 | 10,368 | | | | |
| Hickory shad | 160,300 | 4,320 | 5,300 | 102 | 13,400 | 392 |
| Hogfish | 10,200 | 102 | | | | |
| King whiting or "kingfish" | 722,100 | 21,596 | 106,400 | 3,892 | 101,600 | 1,515 |
| Menhaden | 61,706,000 | 219,531 | | | 9,864,000 | 23,330 |
| Mullet | 3,973,900 | 134,043 | 627,000 | 22,250 | 18,000 | 440 |
| Pigfish | 80,400 | 947 | | | | |
| Pike or pickerel | 400 | 14 | | | | |
| Pinfish or sailors choice | 37,400 | 559 | | | | |
| Pompano | 50,600 | 5,167 | | | | |
| Porgies | | | 1,900 | 32 | | |
| Sea bass | 117,700 | 5,735 | 234,000 | 13,180 | | |
| Sea catfish | | | 120,000 | 3,600 | | |
| Shad | 698,400 | 106,151 | 137,600 | 29,750 | 193,100 | 32,043 |
| Sharks | 231,600 | 772 | 15,000 | 150 | | |
| Sheepshead, salt-water | 13,800 | 441 | 5,000 | 100 | 8,000 | 240 |
| Spadefish | 40,400 | 1,161 | | | | |
| Spanish mackerel | 218,600 | 10,930 | | | | |
| Spot | 5,269,700 | 91,195 | 245,000 | 6,655 | 5,000 | 75 |
| Squeteagues or "sea trout": | | | | | | |
| Gray | 7,525,100 | 214,029 | 5,700 | 271 | | |
| Spotted | 901,100 | 73,701 | 81,000 | 7,230 | 65,000 | 5,850 |
| Striped bass | 712,900 | 69,424 | | | | |
| Sturgeon | 600 | 60 | 24,700 | 2,027 | 7,600 | 1,309 |
| Suckers | 3,000 | 36 | | | | |
| White perch | 161,400 | 6,481 | | | | |
| Yellow perch | 6,700 | 262 | | | | |
| Total | 102,749,300 | 1,300,512 | 1,905,700 | 106,347 | 10,431,800 | 73,414 |
| SHELLFISH, ETC. | | | | | | |
| Crabs: | | | | | | |
| Hard [1] | 3,245,600 | 51,538 | 1,226,500 | 18,408 | 2,257,900 | 34,421 |
| Soft and peelers | 141,800 | 22,600 | 8,300 | 1,230 | | |
| Shrimp | 4,184,000 | 125,502 | 1,200,700 | 36,021 | 9,503,900 | 284,065 |
| Clams, hard, public [2] | 430,000 | 34,343 | 7,900 | 491 | | |
| Oysters, market:[3] | | | | | | |
| Public, spring | 655,900 | 36,067 | | | | |
| Public, fall | 1,218,700 | 72,380 | | | | |
| Private, spring | 24,800 | 1,222 | 1,498,100 | 55,117 | 134,300 | 7,085 |
| Private, fall | 41,500 | 2,382 | 1,313,500 | 49,601 | 104,700 | 5,491 |
| Scallops, bay | 61,900 | 11,680 | | | | |
| Terrapin, diamond-back | | | 4,900 | 493 | 10,000 | 1,100 |
| Turtles: Snapper | 1,500 | 65 | | | | |
| Total | 10,005,700 | 357,779 | 5,259,900 | 161,361 | 12,010,800 | 332,162 |
| Grand total | 112,755,000 | 1,658,291 | 7,165,600 | 267,708 | 22,442,600 | 405,576 |

See footnotes at end of table.

*Fisheries of the South Atlantic and Gulf States, 1937*—Continued

CATCH: BY STATES—Continued

| Species | Florida | | Alabama | | Mississippi | |
|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 400,000 | $1,999 | | | | |
| Amberjack | 50,600 | 1,118 | | | | |
| Angelfish | 9,000 | 240 | | | | |
| Bluefish | 3,578,700 | 171,110 | 28,300 | $1,722 | | |
| Blue runner or hardtail | 769,300 | 8,875 | 14,300 | 351 | | |
| Buffalofish | | | 29,000 | 1,650 | | |
| Cabio or crab eater | 1,800 | 52 | | | | |
| Catfish and bullheads | 4,497,000 | 174,153 | 116,600 | 8,751 | | |
| Cigarfish | 16,800 | 341 | | | | |
| Crappie | 524,100 | 17,346 | | | | |
| Crevalle | 195,900 | 3,576 | | | | |
| Croaker | 35,900 | 595 | 31,000 | 701 | 7,600 | $233 |
| Dolphin | 3,000 | 150 | | | | |
| Drum: | | | | | | |
| Black | 84,800 | 1,912 | 7,700 | 270 | 11,300 | 362 |
| Red or redfish | 1,029,900 | 36,463 | 66,700 | 5,002 | 123,200 | 6,160 |
| Eels, common | 8,600 | 215 | | | | |
| Flounders | 292,500 | 17,713 | 37,300 | 3,560 | 27,800 | 2,472 |
| Groupers | 5,173,000 | 162,663 | 219,200 | 7,670 | 128,600 | 3,857 |
| Grunts | 54,200 | 1,103 | | | | |
| Hickory shad | 51,000 | 1,520 | | | | |
| Hogfish | 11,200 | 218 | | | | |
| Jewfish | 65,300 | 2,370 | | | | |
| Kingfish or "king mackerel" | 3,355,700 | 123,933 | | | | |
| King whiting or "kingfish" | 751,400 | 11,564 | 7,200 | 210 | 8,400 | 262 |
| Menhaden | 139,788,000 | 372,970 | | | | |
| Mojarra | 349,000 | 6,654 | | | | |
| Moonfish | 5,400 | 159 | | | | |
| Mullet | 27,679,600 | 927,430 | 3,733,400 | 108,020 | 161,100 | 4,835 |
| Muttonfish | 233,200 | 14,446 | | | | |
| Paddlefish or spoonbill cat | | | 21,300 | 1,495 | | |
| Permit | 11,800 | 277 | | | | |
| Pigfish | 36,600 | 640 | | | | |
| Pinfish or sailors choice | 32,500 | 474 | | | | |
| Pompano | 641,500 | 132,419 | 1,800 | 338 | 100 | 15 |
| Porgies | 48,500 | 1,435 | | | | |
| Sea bass | 42,000 | 1,940 | | | | |
| Sea catfish | 70,200 | 1,324 | 25,600 | 590 | 10,800 | 216 |
| Shad | 288,400 | 23,606 | | | | |
| Sharks | 2,310,000 | 13,598 | | | | |
| Sheepshead: | | | | | | |
| Fresh-water | | | 13,500 | 675 | | |
| Salt-water | 819,300 | 21,523 | 41,400 | 2,070 | 33,100 | 1,324 |
| Skates | 3,000 | 15 | | | | |
| Snapper: | | | | | | |
| Mangrove | 194,700 | 6,895 | | | | |
| Red | 4,760,900 | 319,359 | 1,168,200 | 83,867 | 303,800 | 21,251 |
| Snook or sergeantfish | 524,000 | 20,800 | | | | |
| Spadefish | 10,800 | 222 | | | | |
| Spanish mackerel | 6,150,000 | 276,192 | 23,300 | 2,016 | 700 | 84 |
| Spot | 293,600 | 5,593 | 35,500 | 799 | 1,200 | 39 |
| Squeteagues or "sea trout": | | | | | | |
| Gray | 400 | 4 | | | | |
| Spotted | 3,335,800 | 214,303 | 145,500 | 13,850 | 210,600 | 18,955 |
| White | 89,100 | 4,020 | 22,500 | 726 | 162,300 | 6,032 |
| Sturgeon | 33,500 | 3,331 | 3,100 | 233 | | |
| Sunfish | 980,700 | 28,536 | | | | |
| Tenpounder | 434,300 | 7,986 | 20,400 | 408 | | |
| Tripletail | 23,200 | 357 | | | | |
| Yellowtail | 109,200 | 7,808 | | | | |
| Total | 210,258,900 | 3,153,575 | 5,812,800 | 244,974 | 1,190,600 | 66,097 |
| SHELLFISH, ETC. | | | | | | |
| Crabs: | | | | | | |
| Hard [1] | 4,526,100 | 73,806 | 756,000 | 11,336 | 1,434,800 | 25,201 |
| Soft and peelers | 1,500 | 89 | | | 1,800 | 306 |
| Stone | 46,100 | 9,316 | | | | |
| Sea crawfish or spiny lobster | 292,500 | 21,621 | | | | |
| Shrimp | 14,037,400 | 431,812 | 3,103,800 | 137,985 | 23,558,000 | 1,060,224 |
| Clams: | | | | | | |
| Coquina | 3,700 | 450 | | | | |
| Hard, public [2] | 748,100 | 49,172 | | | | |
| Conchs | 7,400 | 553 | | | | |
| Oysters, market: [3] | | | | | | |
| Public, spring | 550,900 | 31,606 | 926,100 | 41,583 | 12,339,900 | 542,798 |
| Public, fall | 380,600 | 28,379 | 197,400 | 15,572 | 554,200 | 36,541 |
| Private, spring | 205,100 | 9,757 | 48,800 | 3,077 | | |
| Private, fall | 143,300 | 6,993 | 62,900 | 5,913 | | |
| Scallops, bay | 118,600 | 9,499 | | | | |

See footnotes at end of table.

*Fisheries of the South Atlantic and Gulf States, 1937*—Continued

CATCH: BY STATES—Continued

| Species | Florida | | Alabama | | Mississippi | |
|---|---|---|---|---|---|---|
| SHELLFISH, ETC.—continued | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Terrapin, diamond-back | | | 9, 300 | $930 | 600 | $48 |
| Turtles: | | | | | | |
| Green | 10, 000 | $400 | | | | |
| Soft-shell | 213, 800 | 4, 247 | | | | |
| Sponges: | | | | | | |
| Grass | 21, 700 | 14, 003 | | | | |
| Sheepswool | 444, 000 | 1, 089, 367 | | | | |
| Wire | 16, 200 | 12, 382 | | | | |
| Yellow | 149, 500 | 103, 953 | | | | |
| Total | 21, 916, 500 | 1, 897, 405 | 5, 104, 300 | 216, 396 | 37, 889, 300 | 1, 665, 118 |
| Grand total | 232, 175, 400 | 5, 050, 980 | 10, 917, 100 | 461, 370 | 39, 079, 900 | 1, 731, 215 |

| Species | Louisiana | | Texas | | Total | |
|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | 6, 217, 700 | $60, 460 |
| Amberjack | | | | | 50, 600 | 1, 118 |
| Angelfish | | | | | 9, 000 | 240 |
| Bluefish | | | | | 5, 293, 800 | 257, 206 |
| Blue runner or hardtail | | | | | 783, 600 | 9, 226 |
| Bonito | | | | | 900 | 14 |
| Bowfin | | | | | 3, 100 | 38 |
| Buffalofish | 683, 500 | $34, 782 | 3, 400 | $204 | 715, 900 | 36, 636 |
| Butterfish | | | | | 13, 600 | 376 |
| Cabio or crab eater | 200 | 4 | | | 2, 000 | 56 |
| Carp | | | | | 324, 200 | 6, 923 |
| Catfish and bullheads | 1, 592, 300 | 122, 370 | 66, 600 | 3, 325 | 7, 067, 300 | 333, 617 |
| Cero | | | | | 200 | 8 |
| Cigarfish | | | | | 16, 800 | 341 |
| Crappie | | | | | 524, 100 | 17, 346 |
| Crevalle | | | | | 195, 900 | 3, 576 |
| Croaker | 136, 600 | 3, 877 | 82, 600 | 2, 181 | 10, 285, 500 | 126, 072 |
| Dolphin | | | | | 3, 000 | 150 |
| Drum: | | | | | | |
| Black | 165, 100 | 4, 620 | 1, 549, 000 | 39, 930 | 1, 893, 500 | 49, 606 |
| Red or redfish | 449, 600 | 28, 823 | 954, 500 | 64, 666 | 3, 221, 100 | 164, 106 |
| Eels, common | | | | | 103, 700 | 3, 234 |
| Flounders | 53, 900 | 4, 395 | 110, 600 | 10, 170 | 997, 700 | 64, 378 |
| Garfish | 6, 200 | 124 | | | 6, 200 | 124 |
| Gizzard shad | | | | | 37, 700 | 377 |
| Groupers | 6, 100 | 244 | 19, 600 | 638 | 5, 546, 500 | 175, 072 |
| Grunts | | | | | 59, 200 | 1, 253 |
| Harvestfish or "starfish" | | | | | 640, 900 | 10, 368 |
| Hickory shad | | | | | 230, 000 | 6, 334 |
| Hogfish | | | | | 21, 400 | 350 |
| Jewfish | 17, 000 | 765 | 2, 700 | 91 | 85, 000 | 3, 226 |
| Kingfish or "king mackerel" | | | 3, 000 | 107 | 3, 358, 700 | 124, 040 |
| King whiting or "kingfish" | 25, 800 | 864 | 3, 000 | 65 | 1, 725, 900 | 39, 968 |
| Menhaden | | | | | 211, 358, 000 | 499, 251 |
| Mojarra | | | | | 349, 000 | 6, 654 |
| Moonfish | | | | | 5, 400 | 159 |
| Mullet | 10, 700 | 321 | 6, 600 | 159 | 36, 210, 300 | 1, 197, 498 |
| Muttonfish | | | | | 233, 200 | 14, 446 |
| Paddlefish or spoonbill cat | 49, 400 | 2, 834 | | | 70, 700 | 4, 329 |
| Permit | | | | | 11, 800 | 277 |
| Pigfish | | | | | 117, 000 | 1, 587 |
| Pike or pickerel | | | | | 400 | 14 |
| Pinfish or sailors choice | | | | | 69, 900 | 1, 033 |
| Pompano | 800 | 195 | 4, 500 | 888 | 699, 300 | 139, 022 |
| Porgies | | | | | 50, 400 | 1, 467 |
| Sea bass | | | | | 393, 700 | 20, 855 |
| Sea catfish | 13, 800 | 279 | 31, 300 | 984 | 271, 700 | 6, 993 |
| Shad | | | | | 1, 317, 500 | 191, 550 |
| Sharks | | | | | 2, 556, 600 | 14, 520 |
| Sheepshead: | | | | | | |
| Fresh-water | 590, 200 | 16, 183 | | | 603, 700 | 16, 858 |
| Salt-water | 187, 000 | 10, 074 | 41, 100 | 1, 241 | 1, 148, 700 | 37, 013 |
| Skates | | | | | 3, 000 | 15 |
| Snapper: | | | | | | |
| Mangrove | | | | | 194, 700 | 6, 895 |
| Red | 148, 100 | 12, 068 | 1, 141, 200 | 79, 781 | 7, 522, 200 | 516, 326 |
| Snook or sergeantfish | | | 9, 200 | 554 | 533, 200 | 21, 354 |
| Spadefish | | | | | 51, 200 | 1, 383 |
| Spanish mackerel | 2, 000 | 200 | 38, 800 | 2, 511 | 6, 433, 400 | 291, 933 |
| Spot | 3, 700 | 79 | 12, 000 | 240 | 5, 865, 700 | 104, 675 |

See footnotes at end of table.

## *Fisheries of the South Atlantic and Gulf States, 1937*—Continued

### CATCH: BY STATES—Continued

| Species | Louisiana | | Texas | | Total | |
|---|---|---|---|---|---|---|
| FISH—continued | | | | | | |
| Squeteagues or "sea trout": | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Gray | | | | | 7, 531, 200 | $214, 304 |
| Spotted | 787, 700 | $68, 567 | 2, 089, 800 | $175, 146 | 7, 616, 500 | 577, 602 |
| White | 199, 600 | 8, 193 | 19, 500 | 552 | 493, 000 | 19, 523 |
| Striped bass | | | | | 712, 900 | 69, 424 |
| Sturgeon | | | | | 69, 500 | 6, 960 |
| Suckers | | | | | 3, 000 | 36 |
| Sunfish | | | | | 980, 700 | 28, 536 |
| Tenpounder | | | | | 454, 700 | 8, 394 |
| Tripletail | 2, 000 | 100 | | | 25, 200 | 457 |
| White perch | | | | | 161, 400 | 6, 481 |
| Yellow perch | | | | | 6, 700 | 262 |
| Yellowtail | | | | | 109, 200 | 7, 808 |
| Total | 5, 131, 300 | 319, 961 | 6, 189, 000 | 383, 433 | 343, 669, 400 | 5, 648, 313 |
| SHELLFISH, ETC. | | | | | | |
| Crabs: | | | | | | |
| Hard [1] | 14, 717, 100 | 194, 811 | 921, 600 | 24, 577 | 29, 085, 600 | 434, 098 |
| Soft and peelers | 329, 300 | 50, 957 | | | 482, 700 | 75, 182 |
| Stone | | | | | 46, 100 | 9, 316 |
| Sea crawfish or spiny lobster | | | | | 292, 500 | 21, 621 |
| Shrimp | 68, 780, 900 | 2, 382, 540 | 16, 904, 800 | 551, 404 | 141, 273, 500 | 5, 009, 553 |
| Clams: | | | | | | |
| Coquina | | | | | 3, 700 | 450 |
| Hard, public [2] | | | | | 1, 186, 000 | 84, 006 |
| Conchs | | | | | 7, 400 | 553 |
| Oysters, market:[3] | | | | | | |
| Public, spring | 1, 395, 800 | 76, 225 | 618, 000 | 44, 697 | 16, 486, 600 | 772, 976 |
| Public, fall | 62, 900 | 6, 160 | 571, 600 | 45, 934 | 2, 985, 400 | 204, 966 |
| Private, spring | 4, 234, 400 | 325, 688 | | | 6, 145, 500 | 401, 946 |
| Private, fall | 2, 355, 000 | 244, 443 | | | 4, 020, 900 | 314, 823 |
| Scallops, bay | | | | | 180, 500 | 21, 179 |
| Terrapin, diamond-back | 3, 700 | 400 | | | 28, 500 | 2, 971 |
| Turtles: | | | | | | |
| Green | | | | | 10, 000 | 400 |
| Snapper | | | | | 1, 500 | 65 |
| Soft-shell | | | | | 213, 800 | 4, 247 |
| Sponges: | | | | | | |
| Grass | | | | | 21, 700 | 14, 003 |
| Sheepswool | | | | | 444, 000 | 1, 089, 367 |
| Wire | | | | | 16, 200 | 12, 382 |
| Yellow | | | | | 149, 500 | 103, 953 |
| Total | 91, 879, 100 | 3, 281, 224 | 19, 016, 000 | 666, 612 | 203, 081, 600 | 8, 578, 057 |
| Grand total | 97, 010, 400 | 3, 601, 185 | 25, 205, 000 | 1, 050, 045 | 546, 751, 000 | 14, 226, 370 |

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[1] Statistics on hard crabs used in this table are based on yields of 4.07 pounds per dozen in North Carolina; 6 pounds in South Carolina; 5.71 pounds in Georgia and Alabama; 5.77 pounds in Florida; 5.74 pounds in Mississippi; 5.56 pounds in Louisiana; and 6.12 pounds in Texas.

[2] Statistics on hard clams used in this table are based on yields of 8 pounds of meats per bushel.

[3] Statistics on oysters used in this table are based on yields of 5.52 pounds of meats per bushel in North Carolina; 5.87 pounds in South Carolina; 6.21 pounds in Georgia; 5.49 pounds in Florida; 5.13 pounds in Alabama; 4.95 pounds in Mississippi; 4.09 pounds in Louisiana; and 5.64 pounds in Texas.

NOTE.—The catch for Mississippi includes the following products taken by Mississippi craft in Louisiana waters: Shrimp, 19,064,700 pounds, valued at $658,027; oysters, market, spring, 8,173,000 pounds of meats, valued at $351,784; and oysters, market, fall, 219,400 pounds of meats, valued at $14,315. The seed oyster fishery was prosecuted in this section only in North Carolina where 17 fishermen using 8 sail boats and 14 dredges took 8,000 bushels of seed oysters, valued at $1,760 from public beds. All of the persons and gear engaged in the seed oyster fishery are duplicated among those fishing for market oysters or other species.

### SUPPLEMENTARY TABLE SHOWING THE PRODUCTION OF CERTAIN SHELLFISH IN NUMBER AND BUSHELS

| Product | North Carolina | | South Carolina | | Georgia | |
|---|---|---|---|---|---|---|
| Crabs: | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Hard ............ number | 9, 569, 337 | $51, 538 | 2, 453, 000 | $18, 408 | 4, 745, 149 | $34, 421 |
| Soft and peelers ............ do | 992, 600 | 22, 600 | 24, 900 | 1, 230 | | |
| Clams, hard, public ............ bushels | 53, 750 | 34, 343 | 988 | 491 | | |
| Oysters, market: | | | | | | |
| Public, spring ............ do | 118, 822 | 36, 067 | | | | |
| Public, fall ............ do | 220, 779 | 72, 380 | | | | |
| Private, spring ............ do | 4, 493 | 1, 222 | 255, 213 | 55, 117 | 21, 626 | 7, 085 |
| Private, fall ............ do | 7, 518 | 2, 382 | 223, 765 | 49, 601 | 16, 860 | 5, 491 |
| Scallops, bay ............ do | 8, 060 | 11, 680 | | | | |

*Fisheries of the South Atlantic and Gulf States, 1937*—Continued

SUPPLEMENTARY TABLE SHOWING THE PRODUCTION OF CERTAIN SHELLFISH IN NUMBER AND BUSHELS—Continued

| Product | Florida | | Alabama | | Mississippi | |
|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Crabs: | | | | | | |
| Hard..........number | 9,413,033 | $73,806 | 1,588,792 | $11,336 | 2,999,582 | $25,201 |
| Soft and peelers..........do | 4,500 | 89 | | | 5,400 | 306 |
| Clams, hard, public..........bushels | 93,512 | 49,172 | | | | |
| Oysters, market: | | | | | | |
| Public, spring..........do | 100,346 | 31,606 | 180,526 | 41,583 | 2,492,909 | 542,798 |
| Public, fall..........do | 69,326 | 28,379 | 38,480 | 15,572 | 111,960 | 36,541 |
| Private, spring..........do | 37,359 | 9,757 | 9,513 | 3,077 | | |
| Private, fall..........do | 26,102 | 6,993 | 12,261 | 5,913 | | |
| Scallops, bay..........do | 28,441 | 9,499 | | | | |

| Product | Louisiana | | Texas | | Total | |
|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Crabs: | | | | | | |
| Hard..........number | 31,763,525 | $194,811 | 1,807,059 | $24,577 | 64,339,477 | $434,098 |
| Soft and peelers..........do | 974,728 | 50,957 | | | 2,002,128 | 75,182 |
| Clams, hard, public..........bushels | | | | | 148,250 | 84,006 |
| Oysters, market: | | | | | | |
| Public, spring..........do | 341,271 | 76,225 | 109,574 | 44,697 | 3,343,448 | 772,976 |
| Public, fall..........do | 15,379 | 6,160 | 101,348 | 45,934 | 557,272 | 204,966 |
| Private, spring..........do | 1,035,306 | 325,688 | | | 1,363,510 | 401,946 |
| Private, fall..........do | 575,795 | 244,443 | | | 862,301 | 314,823 |
| Scallops, bay..........do | | | | | 36,501 | 21,179 |

*Industries related to the fisheries of the South Atlantic and Gulf States, 1937*

OPERATING UNITS, SALARIES, AND WAGES

| Item | North Carolina | South Carolina | Georgia | Florida | Alabama | Mississippi | Louisiana | Texas | Total |
|---|---|---|---|---|---|---|---|---|---|
| Transporting: | | | | | | | | | |
| Persons engaged: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 73 | 111 | | 52 | 6 | 6 | 96 | | 344 |
| On boats | 4 | 5 | | 83 | | | 116 | | 208 |
| Total | 77 | 116 | | 135 | 6 | 6 | 212 | | 552 |
| Vessels: | | | | | | | | | |
| Motor | 43 | 11 | | 29 | 3 | 3 | 48 | | 137 |
| Net tonnage | 361 | 144 | | 357 | 37 | 54 | 423 | | 1,376 |
| Sail | 1 | 33 | | | | | | | 34 |
| Net tonnage | 6 | 320 | | | | | | | 326 |
| Total vessels | 44 | 44 | | 29 | 3 | 3 | 48 | | 171 |
| Total net tonnage | 367 | 464 | | 357 | 37 | 54 | 423 | | 1,702 |
| Boats | 2 | 5 | | 82 | | | 58 | | 147 |
| Wholesale and manufacturing: | | | | | | | | | |
| Establishments | 110 | 21 | 24 | 337 | 25 | 41 | 117 | 50 | 725 |
| Persons engaged: | | | | | | | | | |
| Proprietors | 119 | 13 | 18 | 370 | 22 | 24 | 102 | 57 | 725 |
| Salaried employees | 44 | 20 | 30 | 186 | 18 | 63 | 141 | 30 | 532 |
| Wage earners: | | | | | | | | | |
| Average for season | 1,828 | 1,124 | 1,825 | 2,457 | 619 | 2,564 | 5,394 | 1,466 | 17,277 |
| Average for year | 492 | 274 | 422 | 1,115 | 179 | 1,189 | 1,702 | 384 | 5,757 |
| Paid to salaried employees | $57,274 | $36,900 | $52,873 | $244,393 | $23,617 | $94,335 | $205,359 | $35,840 | $750,591 |
| Paid to wage earners | $274,860 | $113,160 | $174,233 | $657,781 | $94,821 | $523,122 | $1,055,780 | $219,429 | $3,113,186 |
| Total salaries and wages | $332,134 | $150,060 | $227,106 | $902,174 | $118,438 | $617,457 | $1,261,139 | $255,269 | $3,863,777 |
| Fishermen manufacturing | 628 | 24 | 23 | 433 | 90 | 108 | 40 | 130 | 1,476 |

*Industries related to the fisheries of the South Atlantic and Gulf States, 1937*—Con.

PRODUCTS MANUFACTURED

| Item | North Carolina | | South Carolina | | Georgia | | Florida | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments: | | | | | | | | |
| Alewives: | | | | | | | | |
| Corned............pounds.. | 3, 231, 200 | $48, 034 | ------ | ------ | ------ | ------ | ------ | ------ |
| Roe, salted............do.... | 26, 800 | 795 | ------ | ------ | ------ | ------ | ------ | ------ |
| Roe, canned..standard cases.. | 12, 670 | 84, 931 | ------ | ------ | ------ | ------ | ------ | ------ |
| Blue runner, salted.....pounds.. | ------ | ------ | ------ | ------ | ------ | ------ | 360, 000 | $12, 580 |
| Groupers: | | | | | | | | |
| Fresh fillets............do.... | ------ | ------ | ------ | ------ | ------ | ------ | 128, 801 | 23, 756 |
| Fresh steaks............do.... | ------ | ------ | ------ | ------ | ------ | ------ | 425, 900 | 65, 940 |
| Menhaden products: | | | | | | | | |
| Acid scrap............tons.. | 10, 731 | 208, 371 | ------ | ------ | (1) | (1) | 8, 633 | 158, 394 |
| Dry scrap............do.... | 3, 493 | 147, 510 | ------ | ------ | ------ | ------ | 3, 374 | 148, 161 |
| Meal............do.... | 2, 546 | 108, 802 | ------ | ------ | ------ | ------ | 4, 639 | 216, 070 |
| Oil............gallons.. | 839, 598 | 294, 443 | ------ | ------ | (1) | (1) | 146, 806 | 55, 803 |
| Mullet: | | | | | | | | |
| Salted............pounds.. | 449, 500 | 27, 983 | ------ | ------ | ------ | ------ | 654, 000 | 35, 290 |
| Roe, salted............do.... | ------ | ------ | ------ | ------ | ------ | ------ | 30, 350 | 7, 338 |
| Snapper, red: | | | | | | | | |
| Fresh fillets............do.... | ------ | ------ | ------ | ------ | ------ | ------ | 72, 000 | 21, 850 |
| Fresh steaks............do.... | ------ | ------ | ------ | ------ | ------ | ------ | 15, 475 | 3, 417 |
| Spanish mackerel, salted..do.... | (1) | (1) | ------ | ------ | ------ | ------ | 80, 000 | 4, 630 |
| Spot, salted............do.... | 63, 400 | 2, 536 | ------ | ------ | ------ | ------ | ------ | ------ |
| Crab meat, packaged, fresh-cooked............pounds.. | 366, 610 | 121, 598 | 129, 143 | $46, 709 | 261, 453 | $93, 559 | 556, 921 | 219, 633 |
| Sea crawfish meat, packaged, fresh-cooked............pounds.. | ------ | ------ | ------ | ------ | ------ | ------ | 92, 800 | 36, 620 |
| Shrimp: | | | | | | | | |
| Cooked and peeled.....do.... | (1) | (1) | ------ | ------ | (1) | (1) | ------ | ------ |
| Canned.....standard cases.. | ------ | ------ | ------ | ------ | 118, 500 | 704, 489 | 47, 439 | 302, 784 |
| Clams, hard, fresh-shucked gallons.. | 23, 075 | 34, 622 | ------ | ------ | ------ | ------ | ------ | ------ |
| Marine-shell novelties............ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 75, 749 |
| Oysters: | | | | | | | | |
| Fresh-shucked......gallons.. | 137, 083 | 125, 483 | 44, 371 | 37, 434 | 10, 980 | 11, 945 | 36, 037 | 49, 727 |
| Canned.....standard cases.. | (1) | (1) | 98, 872 | 428, 562 | (1) | (1) | 14, 536 | 60, 890 |
| Shell products: | | | | | | | | |
| Poultry feed.......tons.. | ------ | ------ | (2) | (2) | ------ | ------ | (1) | (1) |
| Lime and dust.....do.... | 645 | 1, 612 | ------ | ------ | ------ | ------ | (1) | (1) |
| Scallops, bay, fresh-shucked gallons.. | ------ | ------ | ------ | ------ | ------ | ------ | 7, 633 | 17, 142 |
| Unclassified products: | | | | | | | | |
| Packaged, fresh and frozen pounds | (3) | (3) | ------ | ------ | ------ | ------ | [4] 34, 800 | [4] 8, 590 |
| Salted and smoked.....do.... | [5] 31, 127 | [5] 3, 152 | ------ | ------ | ------ | ------ | [6] 25, 100 | [6] 1, 435 |
| Canned.....standard cases.. | (3) | (3) | ------ | ------ | (3) | (3) | [7] 23, 732 | [7] 149, 050 |
| Miscellaneous............ | [8] 231, 214 | [8] 67, 826 | ------ | ------ | [9] 151,322 | [9] 95,101 | [10] 51, 478 | [10] 250, 033 |
| Total............ | ------ | 1, 277, 698 | ------ | 512, 705 | ------ | 905, 094 | ------ | 1, 924, 882 |
| By fishermen: | | | | | | | | |
| Amberjack, smoked.....pounds.. | ------ | ------ | ------ | ------ | ------ | ------ | 900 | 225 |
| Alewives, corned............do.... | 428, 500 | 6, 520 | ------ | ------ | ------ | ------ | ------ | ------ |
| Drum, red, smoked.........do.... | ------ | ------ | ------ | ------ | ------ | ------ | 200 | 50 |
| King whiting, fresh fillets..do.... | ------ | ------ | ------ | ------ | ------ | ------ | 1, 050 | 237 |
| Mullet: | | | | | | | | |
| Salted............do.... | 310, 000 | 18, 600 | 10, 000 | 1, 200 | ------ | ------ | 358, 500 | 18, 060 |
| Smoked............do.... | ------ | ------ | ------ | ------ | ------ | ------ | 31, 450 | 5, 324 |
| Roe, salted............do.... | ------ | ------ | ------ | ------ | ------ | ------ | 5, 000 | 1, 080 |
| Sailfish, smoked............do.... | ------ | ------ | ------ | ------ | ------ | ------ | 10, 000 | 2, 200 |
| Shark products: | | | | | | | | |
| Skins............do.... | ------ | ------ | ------ | ------ | ------ | ------ | 63, 408 | 4, 020 |
| Fins............do.... | ------ | ------ | ------ | ------ | ------ | ------ | 12, 100 | 4, 231 |
| Liver oil............gallons.. | ------ | ------ | ------ | ------ | ------ | ------ | 10, 568 | 4, 227 |
| Spanish mackerel, smoked pounds.. | ------ | ------ | ------ | ------ | ------ | ------ | 300 | 75 |
| Spot, salted............do.... | 150, 000 | 6, 000 | 5, 000 | 350 | ------ | ------ | ------ | ------ |
| Squeteagues, smoked......do.... | ------ | ------ | ------ | ------ | ------ | ------ | 650 | 163 |
| Sturgeon, roe, salted.......do.... | ------ | ------ | 54 | 54 | 115 | 115 | ------ | ------ |
| Crab meat, packaged, fresh-cooked............pounds.. | ------ | ------ | ------ | ------ | ------ | ------ | 1, 200 | 468 |
| Clams, hard, fresh-shucked gallons.. | 9, 800 | 15, 900 | 749 | 823 | ------ | ------ | 110 | 165 |
| Oysters, fresh-shucked.....do.... | 1, 125 | 1, 125 | 3, 434 | 3, 380 | 11, 239 | 8, 991 | 36, 588 | 37, 101 |
| Scallops: | | | | | | | | |
| Bay, fresh-shucked.....do.... | 7, 085 | 11, 680 | ------ | ------ | ------ | ------ | 5, 550 | 6, 248 |
| Total............ | ------ | 59, 825 | ------ | 5, 807 | ------ | 9, 106 | ------ | 83, 874 |
| Grand total............ | ------ | 1, 337, 523 | ------ | 518, 512 | ------ | 914, 200 | ------ | 2, 008, 756 |

See footnotes at end of table.

*Industries related to the fisheries of the South Atlantic and Gulf States, 1937*—Con.

PRODUCTS MANUFACTURED—Continued

| Item | Alabama | | Mississippi | | Louisiana | | Texas | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments: | | | | | | | | |
| Groupers: | | | | | | | | |
| Fresh fillets....pounds.. | (1) | (1) | (1) | (1) | | | | |
| Fresh steaks.......do.... | (1) | (1) | | | | | | |
| Mullet: | | | | | | | | |
| Salted..............do.... | 918, 500 | $17, 310 | (1) | (1) | | | | |
| Roe, salted........do.... | 5, 500 | 1, 210 | | | | | | |
| Snapper, red: | | | | | | | | |
| Fresh fillets.......do.... | (1) | (1) | (1) | (1) | | | | |
| Fresh steaks.......do.... | (1) | (1) | | | | | | |
| Squeteagues, salted...do.... | | | | | 20, 800 | $3, 120 | | |
| Crab meat, packaged, fresh-cooked............pounds.. | 71, 500 | 15, 958 | 201, 771 | $55, 154 | 1, 304, 303 | 368, 074 | 34, 680 | $9, 056 |
| Shrimp: | | | | | | | | |
| Cooked and peeled pounds.. | (1) | (1) | 473, 055 | 139, 584 | 218, 069 | 71, 382 | (1) | (1) |
| Canned standard cases.. | 45, 153 | 242, 911 | 312, 151 | 1, 663, 951 | 702, 817 | 3, 862, 353 | 60, 295 | 353, 963 |
| Meal...............tons.. | | | | | 1, 334 | 30, 573 | | |
| Sun-dried.......pounds.. | | | | | 1, 366, 805 | 250, 077 | | |
| Oysters: | | | | | | | | |
| Fresh-shucked..gallons.. | 25, 904 | 34, 994 | 40, 412 | 65, 211 | 259, 800 | 391, 306 | 98, 237 | 138, 395 |
| Canned standard cases.. | 31, 561 | 132, 256 | 321, 964 | 1, 316, 664 | 116, 266 | 462, 760 | | |
| Shell products: | | | | | | | | |
| Poultry feed...tons.. | (1) | (1) | 17, 045 | 62, 397 | (1) | (1) | (1) | (1) |
| Lime and dust.do... | (1) | (1) | 2, 945 | 4, 274 | (1) | (1) | (1) | (1) |
| Unclassified products: | | | | | | | | |
| Packaged, fresh and frozen.........pounds.. | (3) | (3) | (3) | (3) | | | | |
| Salted and smoked.do.... | | | (3) | (3) | | | | |
| Canned standard cases.. | | | | | (3) | (3) | | |
| Miscellaneous............ | [11] 74, 500 | [11] 31, 315 | [12] 53, 312 | [12] 8, 340 | [13] 117, 484 | [13] 358, 306 | [14] 75, 800 | [14] 128, 478 |
| Total.................... | | 505, 954 | | 3, 315, 575 | | 5, 797, 951 | | 629, 892 |
| By fishermen: | | | | | | | | |
| Crab meat, packaged, fresh-cooked..........pounds.. | 35, 400 | 7, 780 | 29, 460 | 7, 660 | | | 37, 268 | 7, 923 |
| Shrimp, sun-dried......do.... | | | | | 9, 500 | 1, 570 | | |
| Oysters, fresh-shucked gallons | 11, 430 | 11, 677 | 16, 810 | 19, 322 | 1, 400 | 1, 610 | 20, 859 | 24, 748 |
| Total.................... | | 19, 457 | | 26, 982 | | 3, 180 | | 32, 671 |
| Grand total............ | | 525, 411 | | 3, 342, 557 | | 5, 801, 131 | | 662, 563 |

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[1] This item has been included under "Unclassified products."

[2] A small production of oyster-shell poultry feed manufactured in South Carolina has been included with the production of miscellaneous products in Georgia.

[3] This item has been included under "Miscellaneous."

[4] Includes fresh fillets of king mackerel, muttonfish, snook, Spanish mackerel, and squeteagues; fresh steaks of cabio and snook; and fresh pan-dressed red drum.

[5] Includes smoked alewives, and salted bluefish, king whiting roe, and Spanish mackerel fillets.

[6] Includes salted bluefish and tenpounder, and smoked mullet.

[7] Includes canned hard-clam products, coquina-clam broth, and frog and turtle products.

[8] Includes fresh fillets of croaker, red drum, flounders, sea bass, Spanish mackerel, and squeteagues; frozen fillets of bluefish, king whiting, Spanish mackerel, spot, and squeteagues; fresh pan-dressed croaker, red drum, flounders, sea bass, Spanish mackerel, scup, and squeteagues; cooked and peeled shrimp; canned oysters; alewife scrap and oil; and shark hides, fins, and liver oil.

[9] Includes canned oysters and terrapin products; cooked and peeled shrimp; menhaden acid scrap and oil; and a small quantity of oyster-shell poultry feed which was produced in South Carolina.

[10] Includes oyster-shell poultry feed and lime; and shark dry scrap.

[11] Includes fresh fillets of groupers, red snapper, Spanish mackerel, and squeteagues; fresh steaks of groupers and red snapper; cooked and peeled shrimp; and oyster-shell poultry feed and lime.

[12] Includes fresh fillets of groupers and red snapper; salted mullet; and canned crab and shrimp gumbo.

[13] Includes canned soft crabs, crab and shrimp gumbo, terrapin products, turtle meat, fish bouillon, crawfish soup, and frog products; and oyster-shell poultry feed and lime.

[14] Includes cooked and peeled shrimp, and oyster-shell poultry feed and lime.

NOTE.—The total value of manufactured products in the South Atlantic and Gulf States was as follows: By manufacturing establishments, $15,110,653; and by fishermen, $240,902. Some of the above products may have been imported from another State or a foreign country; therefore, they cannot be correlated directly with the catch within the State. All except 13 of the persons engaged in the preparation of fishermen's manufactured products have also been included as fishermen, and 312 of the persons shown on transporting craft have also been included as fishermen. This should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## NORTH CAROLINA

### *Fisheries of North Carolina, 1937*

OPERATING UNITS: BY GEAR

| Item | Purse seines | | Haul seines | | Gill nets | | | | Lines |
|---|---|---|---|---|---|---|---|---|---|
| | Menhaden | Other | Common | Long | Anchor | Drift | Run-around | Stake | Hand |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 347 | -------- | 34 | 140 | 173 | -------- | 50 | -------- | 23 |
| On boats and shore: | | | | | | | | | |
| Regular | -------- | 12 | 1,903 | 322 | 445 | 48 | 686 | 317 | 44 |
| Casual | -------- | -------- | 339 | -------- | 202 | 210 | 100 | 58 | -------- |
| Total | 347 | 12 | 2,276 | 462 | 820 | 258 | 836 | 375 | 67 |
| Vessels; motor: | | | | | | | | | |
| 5 to 10 tons | 5 | -------- | 8 | 47 | 58 | -------- | 18 | -------- | 4 |
| 11 to 20 tons | 6 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 1 |
| 21 to 30 tons | 3 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| 31 to 40 tons | 2 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| 41 to 50 tons | 3 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| 51 to 60 tons | 4 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| 61 to 70 tons | 1 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Total | 24 | -------- | 8 | 47 | 58 | -------- | 18 | -------- | 5 |
| Net tonnage | 700 | -------- | 50 | 316 | 357 | -------- | 112 | -------- | 44 |
| Boats: | | | | | | | | | |
| Motor | -------- | 4 | 209 | 115 | 250 | 61 | 268 | 182 | 17 |
| Other | -------- | 2 | 553 | 115 | 88 | 67 | 480 | 95 | -------- |
| Accessory boats | 61 | -------- | 5 | 47 | -------- | -------- | 9 | -------- | 4 |
| Apparatus: | | | | | | | | | |
| Number | 24 | 2 | 585 | 81 | 2,047 | 128 | 565 | 5,994 | 117 |
| Length, yards | 5,857 | 400 | 111,425 | 80,500 | -------- | -------- | -------- | -------- | -------- |
| Square yards | -------- | -------- | -------- | -------- | 1,010,040 | 152,340 | 380,110 | 429,930 | -------- |
| Hooks, baits, or snoods | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 134 |

| Item | Lines—Continued | | | Pound nets | Wheels | Fyke nets | Dip nets | Otter trawls | |
|---|---|---|---|---|---|---|---|---|---|
| | Troll | Trot with baits or snoods | Trot with hooks | | | | | Fish | Shrimp |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 3 | 127 |
| On boats and shore: | | | | | | | | | |
| Regular | 32 | 897 | -------- | 456 | -------- | 13 | 310 | -------- | 301 |
| Casual | -------- | 160 | 31 | 211 | 10 | 35 | 189 | -------- | -------- |
| Total | 32 | 1,057 | 31 | 667 | 10 | 48 | 499 | 3 | 428 |
| Vessels, motor: | | | | | | | | | |
| 5 to 10 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 47 |
| 11 to 20 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 1 | 2 |
| Total | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 1 | 49 |
| Net tonnage | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 17 | 306 |
| Boats: | | | | | | | | | |
| Motor | 16 | 141 | 6 | 320 | 2 | 25 | -------- | -------- | 145 |
| Other | -------- | 422 | 9 | 109 | 4 | 8 | 170 | -------- | -------- |
| Apparatus: | | | | | | | | | |
| Number | 32 | 673 | 15 | 3,083 | 10 | 557 | 469 | 1 | 194 |
| Yards at mouth | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 20 | 3,247 |
| Hooks, baits, or snoods | 32 | 442,900 | 2,450 | -------- | -------- | -------- | -------- | -------- | -------- |

## *Fisheries of North Carolina, 1937*—Continued

### OPERATING UNITS: By gear—Continued

| Item | Pots |  |  | Spears | Dredges, oyster | Tongs, oyster | Rakes, other than for oysters | By hand, oyster | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|
|  | Eel | Fish | Turtle |  |  |  |  |  |  |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | -------- | -------- | -------- | -------- | 171 | 4 | -------- | -------- | 900 |
| On boats and shore: |  |  |  |  |  |  |  |  |  |
| Regular | 22 | -------- | -------- | 237 | 204 | 116 | 691 | 108 | 3, 759 |
| Casual | 24 | 12 | 4 | 80 | 8 | -------- | 417 | 10 | 1, 960 |
| Total | 46 | 12 | 4 | 317 | 383 | 120 | 1, 108 | 118 | 6, 619 |
| Vessels: |  |  |  |  |  |  |  |  |  |
| Motor: |  |  |  |  |  |  |  |  |  |
| 5 to 10 tons | -------- | -------- | -------- | -------- | 1 | 1 | -------- | -------- | 130 |
| 11 to 20 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 10 |
| 21 to 30 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 3 |
| 31 to 40 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 2 |
| 41 to 50 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 3 |
| 51 to 60 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 4 |
| 61 to 70 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 1 |
| Total | -------- | -------- | -------- | -------- | 1 | 1 | -------- | -------- | 153 |
| Net tonnage | -------- | -------- | -------- | -------- | 6 | 6 | -------- | -------- | 1, 549 |
| Sail: |  |  |  |  |  |  |  |  |  |
| 5 to 10 tons | -------- | -------- | -------- | -------- | 47 | -------- | -------- | -------- | 47 |
| 11 to 20 tons | -------- | -------- | -------- | -------- | 12 | -------- | -------- | -------- | 12 |
| 21 to 30 tons | -------- | -------- | -------- | -------- | 2 | -------- | -------- | -------- | 2 |
| Total | -------- | -------- | -------- | -------- | 61 | -------- | -------- | -------- | 61 |
| Net tonnage | -------- | -------- | -------- | -------- | 549 | -------- | -------- | -------- | 549 |
| Total vessels | -------- | -------- | -------- | -------- | 62 | 1 | -------- | -------- | 214 |
| Total net tonnage | -------- | -------- | -------- | -------- | 555 | 6 | -------- | -------- | 2, 098 |
| Boats: |  |  |  |  |  |  |  |  |  |
| Motor | 35 | -------- | 2 | -------- | 79 | 4 | -------- | -------- | 1, 339 |
| Other | 5 | 12 | -------- | 279 | 32 | 112 | 461 | 69 | 1, 818 |
| Accessory boats | -------- | -------- | -------- | -------- | -------- | 2 | -------- | -------- | 122 |
| Apparatus: |  |  |  |  |  |  |  |  |  |
| Number | 1, 412 | 54 | 68 | 317 | 296 | 120 | 1, 108 | -------- | -------- |
| Yards at mouth | -------- | -------- | -------- | -------- | 286 | -------- | -------- | -------- | -------- |

### CATCH: By gear

| Species | Purse seines |  |  |  | Haul seines |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  | Menhaden |  | Other |  | Common |  | Long |  |
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | -------- | -------- | -------- | -------- | 518, 200 | $5, 199 | -------- | -------- |
| Bluefish | -------- | -------- | -------- | -------- | 264, 200 | 13, 210 | 331, 500 | $16, 575 |
| Bonito | -------- | -------- | -------- | -------- | 900 | 14 | -------- | -------- |
| Bowfin | -------- | -------- | -------- | -------- | 1, 200 | 12 | -------- | -------- |
| Butterfish | -------- | -------- | -------- | -------- | 3, 600 | 107 | -------- | -------- |
| Carp | -------- | -------- | -------- | -------- | 88, 000 | 1, 760 | -------- | -------- |
| Catfish and bullheads | -------- | -------- | -------- | -------- | 52, 800 | 1, 097 | -------- | -------- |
| Cero | -------- | -------- | -------- | -------- | 200 | 8 | -------- | -------- |
| Croaker | -------- | -------- | -------- | -------- | 766. 700 | 9, 133 | 3, 422, 200 | 37, 457 |
| Drum: |  |  |  |  |  |  |  |  |
| Black | -------- | -------- | -------- | -------- | 27, 400 | 876 | 4, 900 | 49 |
| Red or redfish | -------- | -------- | -------- | -------- | 333, 800 | 12, 696 | 48, 600 | 727 |
| Eels, common | -------- | -------- | -------- | -------- | 400 | 9 | -------- | -------- |
| Flounders | -------- | -------- | -------- | -------- | 76, 200 | 3, 810 | 18, 400 | 920 |
| Gizzard shad | -------- | -------- | -------- | -------- | 21, 300 | 213 | -------- | -------- |
| Harvestfish or "starfish" | -------- | -------- | -------- | -------- | 102, 400 | 1, 789 | 27, 400 | 417 |
| Hickory shad | -------- | -------- | -------- | -------- | 30, 500 | 847 | 2, 000 | 60 |
| Hogfish | -------- | -------- | -------- | -------- | -------- | -------- | 2, 000 | 20 |
| King whiting or "kingfish" | -------- | -------- | -------- | -------- | 79, 900 | 2, 397 | 155, 400 | 4, 665 |
| Menhaden | 61, 326, 000 | $218, 147 | -------- | -------- | -------- | -------- | 356, 000 | 1, 299 |
| Mullet | -------- | -------- | 8, 000 | $240 | 1, 868, 900 | 67, 147 | 6, 600 | 198 |
| Pigfish | -------- | -------- | -------- | -------- | 48, 100 | 624 | 14, 000 | 140 |
| Pinfish or sailors choice | -------- | -------- | -------- | -------- | 37, 000 | 555 | 400 | 4 |
| Pompano | -------- | -------- | -------- | -------- | 31, 700 | 3, 227 | 100 | 15 |
| Shad | -------- | -------- | -------- | -------- | 68, 300 | 10, 405 | 1, 000 | 150 |

## *Fisheries of North Carolina, 1937*—Continued

CATCH: By gear—Continued

| Species | Purse seines | | | | Haul seines | | | |
|---|---|---|---|---|---|---|---|---|
| | Menhaden | | Other | | Common | | Long | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Sheepshead | | | | | 12, 600 | $393 | 1, 000 | $40 |
| Spadefish | | | | | 37, 300 | 1, 100 | 3, 100 | 61 |
| Spanish mackerel | | | | | 23, 200 | 1, 160 | | |
| Spot | | | | | 2, 829, 800 | 53, 763 | 1, 066, 400 | 13, 947 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | | | 305, 200 | 7, 938 | 1, 825, 600 | 53, 503 |
| Spotted | | | | | 345, 300 | 28, 710 | 323, 900 | 25, 881 |
| Striped bass | | | 55, 000 | $5, 500 | 139, 300 | 13, 472 | 59, 000 | 5, 900 |
| Sturgeon | | | | | | | 400 | 40 |
| White perch | | | | | 72, 400 | 2, 825 | | |
| Yellow perch | | | | | 2, 200 | 88 | | |
| Crabs, soft and peelers | | | | | 92, 800 | 14, 832 | | |
| Shrimp | | | | | 2, 000 | 60 | | |
| Total | 61, 326, 000 | $218, 147 | 63, 000 | 5, 740 | 8, 283, 800 | 259, 476 | 7, 669, 900 | 162, 068 |

| Species | Gill nets | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Anchor | | Drift | | Runaround | | Stake | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 231, 200 | $2, 347 | 47, 000 | $470 | | | 41, 800 | $452 |
| Bluefish | 34, 500 | 1, 725 | | | 670, 200 | $33, 510 | 311, 100 | 15, 055 |
| Bowfin | 300 | 3 | | | | | 200 | 2 |
| Carp | 11, 500 | 230 | 300 | 6 | 2, 200 | 44 | 42, 600 | 852 |
| Croaker | 2, 358, 500 | 33, 533 | | | 29, 500 | 295 | 874, 500 | 11, 701 |
| Drum: | | | | | | | | |
| Black | | | | | | | 200 | 6 |
| Red or redfish | | | | | 23, 300 | 466 | 8, 900 | 356 |
| Gizzard shad | 6, 100 | 61 | | | | | 1, 200 | 12 |
| Hickory shad | 29, 300 | 878 | 1, 000 | 30 | | | 29, 800 | 822 |
| King whiting or "kingfish" | 400, 500 | 11, 945 | | | | | 2, 600 | 78 |
| Mullet | 6, 300 | 189 | | | 2, 056, 800 | 65, 450 | 24, 300 | 729 |
| Pigfish | | | | | 700 | 7 | | |
| Pompano | | | | | 18, 500 | 1, 880 | | |
| Shad | 130, 100 | 19, 803 | 34, 600 | 5, 218 | | | 102, 500 | 15, 608 |
| Sharks | 231, 600 | 772 | | | | | | |
| Spanish mackerel | | | | | 135, 500 | 6, 775 | 5, 500 | 275 |
| Spot | | | | | 884, 800 | 16, 768 | 441, 300 | 6, 012 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 2, 055, 900 | 75, 814 | | | | | 358, 000 | 13, 269 |
| Spotted | 23, 200 | 2, 008 | | | 124, 500 | 10, 600 | 34, 300 | 2, 751 |
| Striped bass | 96, 200 | 9, 358 | 1, 100 | 110 | | | 56, 200 | 5, 538 |
| Sturgeon | 100 | 10 | | | | | 100 | 10 |
| Suckers | 800 | 4 | | | | | 800 | 4 |
| White perch | 18, 600 | 747 | 3, 000 | 120 | | | 18, 700 | 751 |
| Total | 5, 634, 700 | 159, 427 | 87, 000 | 5, 954 | 3, 946, 000 | 135, 795 | 2, 354, 600 | 74, 283 |

| Species | Lines | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Hand | | Troll | | Trot with baits or snoods | | Trot with hooks | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Catfish and bullheads | | | | | | | 26, 000 | $560 |
| Sea bass | 117, 700 | $5, 735 | | | | | | |
| Spanish mackerel | | | 6, 400 | $320 | | | | |
| Crabs, hard | | | | | 3, 229, 400 | $51, 395 | | |
| Total | 117, 700 | 5, 735 | 6, 400 | 320 | 3, 229, 400 | 51, 395 | 26, 000 | 560 |

## *Fisheries of North Carolina, 1937*—Continued

### CATCH: BY GEAR—Continued

| Species | Pound nets | | Wheels | | Fyke nets | | Dip nets | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 4,876,800 | $48,960 | 30,500 | $305 | 53,200 | $538 | 19,000 | $190 |
| Bluefish | 45,500 | 1,936 | | | | | | |
| Bowfin | 200 | 2 | | | 1,200 | 19 | | |
| Butterfish | 9,800 | 263 | | | | | | |
| Carp | 73,600 | 1,491 | | | 105,200 | 2,524 | | |
| Catfish and bullheads | 294,500 | 8,387 | | | 269,700 | 8,228 | | |
| Croaker | 2,508,500 | 25,800 | | | | | | |
| Drum: | | | | | | | | |
| Black | 2,100 | 21 | | | | | | |
| Red or redfish | 26,600 | 532 | | | | | | |
| Eels, common | 500 | 24 | | | 200 | 4 | | |
| Flounders | 133,900 | 6,695 | | | | | | |
| Gizzard shad | 6,700 | 67 | | | 2,400 | 24 | | |
| Harvestfish or "starfish" | 511,100 | 8,162 | | | | | | |
| Hickory shad | 66,900 | 1,659 | | | 800 | 24 | | |
| Hogfish | 8,200 | 82 | | | | | | |
| King whiting or "kingfish" | 8,300 | 249 | | | | | | |
| Menhaden | 24,000 | 85 | | | | | | |
| Mullet | 3,000 | 90 | | | | | | |
| Pigfish | 17,600 | 176 | | | | | | |
| Pike or pickerel | 200 | 6 | | | 200 | 8 | | |
| Pompano | 300 | 45 | | | | | | |
| Shad | 361,900 | 54,967 | | | | | | |
| Sheepshead | 200 | 8 | | | | | | |
| Spanish mackerel | 48,000 | 2,400 | | | | | | |
| Spot | 47,400 | 705 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 2,972,400 | 63,185 | | | | | | |
| Spotted | 49,900 | 3,751 | | | | | | |
| Striped bass | 288,700 | 27,826 | | | 17,400 | 1,720 | | |
| Suckers | 300 | 6 | | | 1,100 | 22 | | |
| White perch | 18,900 | 856 | 1,800 | 72 | 10,000 | 390 | | |
| Yellow perch | 700 | 26 | | | 3,800 | 148 | | |
| Crabs, soft and peelers | | | | | | | 49,000 | 7,768 |
| Shrimp | 41,500 | 1,245 | | | | | | |
| Total | 12,448,200 | 259,707 | 32,300 | 377 | 465,200 | 13,649 | 68,000 | 7,958 |

| Species | Otter trawls | | Pots | | Spears | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Carp | | | 800 | $16 | | |
| Catfish and bullheads | | | 10,300 | 206 | | |
| Croaker | 28,000 | $430 | | | | |
| Eels, common | | | 90,000 | 2,502 | | |
| Flounders | 80,300 | 4,015 | | | 95,000 | $4,750 |
| King whiting or "kingfish" | 75,400 | 2,262 | | | | |
| Squeteagues or "sea trout," gray | 8,000 | 320 | | | | |
| White perch | | | 18,000 | 720 | | |
| Crabs, hard | 16,200 | 143 | | | | |
| Shrimp | 4,140,500 | 124,197 | | | | |
| Turtles, snapper | | | 1,500 | 65 | | |
| Total | 4,348,400 | 131,367 | 120,600 | 3,509 | 95,000 | 4,750 |

| Species | Dredges | | Tongs | | Rakes | | By hand | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams, hard, public | | | | | 430,000 | $34,343 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 590,700 | $32,222 | 43,700 | $2,665 | | | 21,500 | $1,180 |
| Public, fall | 1,104,000 | 64,687 | 85,700 | 6,322 | | | 29,000 | 1,371 |
| Private, spring | 11,500 | 431 | 13,300 | 791 | | | | |
| Private, fall | 20,100 | 780 | 21,400 | 1,602 | | | | |
| Scallops, bay | | | | | 61,900 | 11,680 | | |
| Total | 1,726,300 | 98,120 | 164,100 | 11,380 | 491,900 | 46,023 | 50,500 | 2,551 |

*Fisheries of North Carolina, 1937*—Continued

OPERATING UNITS: BY COUNTIES

| Item | Beaufort | Bertie | Brunswick | Camden | Carteret | Chowan | Craven |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 106 |  | 122 |  | 527 |  |  |
| On boats and shore: |  |  |  |  |  |  |  |
| Regular | 160 |  | 433 |  | 1, 302 |  | 39 |
| Casual | 70 | 48 | 94 | 17 | 544 | 162 | 16 |
| Total | 336 | 48 | 649 | 17 | 2, 373 | 162 | 55 |
| Vessels: |  |  |  |  |  |  |  |
| Motor: |  |  |  |  |  |  |  |
| 5 to 10 tons | 1 |  | 21 |  | 75 |  |  |
| 11 to 20 tons |  |  | 2 |  | 7 |  |  |
| 21 to 30 tons |  |  |  |  | 3 |  |  |
| 31 to 40 tons |  |  |  |  | 2 |  |  |
| 41 to 50 tons |  |  | 2 |  | 1 |  |  |
| 51 to 60 tons |  |  |  |  | 4 |  |  |
| 61 to 70 tons |  |  | 1 |  |  |  |  |
| Total | 1 |  | 26 |  | 92 |  |  |
| Net tonnage | 9 |  | 326 |  | 992 |  |  |
| Sail: |  |  |  |  |  |  |  |
| 5 to 10 tons | 30 |  |  |  | 4 |  |  |
| 11 to 20 tons | 7 |  |  |  | 3 |  |  |
| 21 to 30 tons | 2 |  |  |  |  |  |  |
| Total | 39 |  |  |  | 7 |  |  |
| Net tonnage | 355 |  |  |  | 78 |  |  |
| Total vessels | 40 |  | 26 |  | 99 |  |  |
| Total net tonnage | 364 |  | 326 |  | 1, 070 |  |  |
| Boats: |  |  |  |  |  |  |  |
| Motor | 52 | 13 | 78 | 3 | 329 | 67 | 11 |
| Other | 69 | 2 | 151 | 12 | 692 | 7 | 15 |
| Accessory boats | 1 |  | 9 |  | 91 |  |  |
| Apparatus: |  |  |  |  |  |  |  |
| Purse seines, menhaden |  |  | 3 |  | 21 |  |  |
| Length, yards |  |  | 850 |  | 5, 007 |  |  |
| Haul seines: |  |  |  |  |  |  |  |
| Common | 6 | 2 | 24 |  | 342 | 1 | 8 |
| Length, yards | 1, 200 | 2, 000 | 5, 000 |  | 42, 575 | 360 | 1, 600 |
| Long | 4 |  |  |  | 30 |  |  |
| Length, yards | 3, 800 |  |  |  | 30, 000 |  |  |
| Gill nets: |  |  |  |  |  |  |  |
| Anchor |  |  | 30 | 50 | 115 | 206 |  |
| Square yards |  |  | 8, 400 | 5, 000 | 250, 500 | 72, 100 |  |
| Drift |  |  | 11 |  |  |  |  |
| Square yards |  |  | 4, 400 |  |  |  |  |
| Runaround | 44 |  | 111 |  | 92 |  | 6 |
| Square yards | 16, 600 |  | 29, 400 |  | 67, 250 |  | 5, 800 |
| Stake | 272 |  |  | 82 | 1, 491 |  | 540 |
| Square yards | 14, 700 |  |  | 5, 740 | 105, 650 |  | 32, 400 |
| Lines: |  |  |  |  |  |  |  |
| Hand |  |  |  |  | 17 |  |  |
| Hooks |  |  |  |  | 34 |  |  |
| Troll |  |  |  |  | 32 |  |  |
| Hooks |  |  |  |  | 32 |  |  |
| Trot with baits or snoods | 124 |  | 44 |  | 160 |  |  |
| Baits or snoods | 89, 500 |  | 16, 600 |  | 125, 200 |  |  |
| Pound nets | 77 | 150 |  |  | 105 | 920 | 19 |
| Fyke nets |  |  |  | 30 |  |  |  |
| Dip nets |  |  |  |  | 425 |  |  |
| Otter trawls, shrimp | 4 |  | 61 |  | 115 |  |  |
| Yards at mouth | 38 |  | 1, 197 |  | 1, 787 |  |  |
| Pots, eel | 55 |  |  |  |  |  |  |
| Spears |  |  | 95 |  | 37 |  |  |
| Dredges, oyster | 102 |  |  |  | 16 |  |  |
| Yards at mouth | 117 |  |  |  | 17 |  |  |
| Tongs, oyster |  |  |  |  | 43 |  |  |
| Rakes, other than for oysters |  |  | 6 |  | 1, 090 |  |  |

*Fisheries of North Carolina, 1937*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Currituck | Dare | Gates | Hertford | Hyde | Martin | New Hanover |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels |  | 46 |  |  | 9 |  |  |
| On boats and shore: |  |  |  |  |  |  |  |
| Regular | 110 | 723 |  |  | 201 |  | 182 |
| Casual | 84 | 2 | 8 | 38 |  | 123 | 246 |
| Total | 194 | 771 | 8 | 38 | 210 | 123 | 428 |
| Vessels: |  |  |  |  |  |  |  |
| Motor, 5 to 10 tons |  | 16 |  |  | 1 |  |  |
| Net tonnage |  | 96 |  |  | 5 |  |  |
| Sail, 5 to 10 tons |  |  |  |  | 2 |  |  |
| Net tonnage |  |  |  |  | 14 |  |  |
| Total vessels |  | 16 |  |  | 3 |  |  |
| Total net tonnage |  | 96 |  |  | 19 |  |  |
| Boats: |  |  |  |  |  |  |  |
| Motor | 70 | 281 | 3 | 10 | 81 | 17 | 43 |
| Other | 65 | 187 | 3 | 6 | 56 | 42 | 185 |
| Accessory boats |  | 8 |  |  |  |  |  |
| Apparatus: |  |  |  |  |  |  |  |
| Purse seines, other than for menhaden |  | 2 |  |  |  |  |  |
| Length, yards |  | 400 |  |  |  |  |  |
| Haul seines: |  |  |  |  |  |  |  |
| Common | 47 | 54 |  | 6 | 6 | 2 | 24 |
| Length, yards | 14,810 | 25,000 |  | 1,200 | 1,650 | 1,200 | 3,080 |
| Long |  | 21 |  |  |  |  |  |
| Length, yards |  | 21,000 |  |  |  |  |  |
| Gill nets: |  |  |  |  |  |  |  |
| Anchor | 165 | 544 | 3 | 2 | 6 |  |  |
| Square yards | 25,300 | 211,940 | 600 | 600 | 12,800 |  |  |
| Drift |  |  | 2 | 7 |  | 9 | 92 |
| Square yards |  |  | 400 | 1,400 |  | 9,200 | 128,800 |
| Runaround |  | 50 |  |  | 19 |  | 88 |
| Square yards |  | 139,000 |  |  | 16,000 |  | 17,300 |
| Stake | 60 | 2,170 |  |  | 462 |  | 68 |
| Square yards | 4,800 | 128,400 |  |  | 48,400 |  | 5,440 |
| Lines: |  |  |  |  |  |  |  |
| Hand |  |  |  |  |  |  | 24 |
| Hooks |  |  |  |  |  |  | 24 |
| Trot with baits or snoods | 6 | 7 |  |  | 38 |  | 77 |
| Baits or snoods | 6,000 | 7,000 |  |  | 24,800 |  | 25,500 |
| Trot with hooks |  |  |  |  |  | 12 | 3 |
| Hooks |  |  |  |  |  | 650 | 1,800 |
| Pound nets | 11 | 1,198 | 14 | 32 | 195 |  |  |
| Wheels |  |  |  |  |  | 10 |  |
| Fyke nets | 265 |  |  |  |  |  |  |
| Dip nets | 10 |  |  |  |  | 30 |  |
| Pots: |  |  |  |  |  |  |  |
| Eel | 1,185 | 120 |  |  |  |  |  |
| Fish |  |  |  |  |  | 54 |  |
| Turtle | 68 |  |  |  |  |  |  |
| Spears |  | 30 |  |  | 10 |  | 80 |
| Dredges, oyster |  |  |  |  | 37 |  |  |
| Yards at mouth |  |  |  |  | 39 |  |  |
| Tongs, oyster |  |  |  |  | 3 |  |  |
| Rakes, other than for oysters |  |  |  |  |  |  | 12 |

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## *Fisheries of North Carolina, 1937*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Onslow | Pamlico | Pasquotank | Pender | Perquimans | Tyrrell | Washington |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 14 | 73 | 3 | | | | |
| On boats and shore: | | | | | | | |
| Regular | 180 | 257 | 23 | 127 | 8 | 14 | |
| Casual | 138 | | 32 | 45 | 75 | 108 | 110 |
| Total | 332 | 330 | 58 | 172 | 83 | 122 | 110 |
| Vessels: | | | | | | | |
| Motor: | | | | | | | |
| 5 to 10 tons | 4 | 12 | | | | | |
| 11 to 20 tons | | | 1 | | | | |
| Total | 4 | 12 | 1 | | | | |
| Net tonnage | 28 | 76 | 17 | | | | |
| Sail: | | | | | | | |
| 5 to 10 tons | | 11 | | | | | |
| 11 to 20 tons | | 2 | | | | | |
| Total | | 13 | | | | | |
| Net tonnage | | 102 | | | | | |
| Total vessels | 4 | 25 | 1 | | | | |
| Total net tonnage | 28 | 178 | 17 | | | | |
| Boats: | | | | | | | |
| Motor | 33 | 113 | 16 | 2 | 30 | 53 | 34 |
| Other | 129 | 54 | 5 | 52 | 25 | 43 | 18 |
| Accessory boats | 2 | 11 | | | | | |
| Apparatus: | | | | | | | |
| Haul seines: | | | | | | | |
| Common | 31 | 6 | 5 | 17 | 2 | | 2 |
| Length, yards | 4,610 | 1,200 | 1,100 | 3,040 | 200 | | 1,600 |
| Long | | 26 | | | | | |
| Length, yards | | 25,700 | | | | | |
| Gill nets: | | | | | | | |
| Anchor | 15 | | 190 | | 415 | 106 | 200 |
| Square yards | 30,200 | | 55,000 | | 186,000 | 63,600 | 88,000 |
| Drift | | | | | | 3 | 4 |
| Square yards | | | | | | 4,500 | 3,600 |
| Runaround | 109 | 24 | 1 | 21 | | | |
| Square yards | 54,560 | 28,800 | 2,200 | 3,200 | | | |
| Stake | | 405 | 32 | | 12 | 400 | |
| Square yards | | 32,400 | 2,400 | | 1,200 | 48,400 | |
| Lines: | | | | | | | |
| Hand | 76 | | | | | | |
| Hooks | 76 | | | | | | |
| Trot with baits or snoods | 115 | 90 | | 12 | | | |
| Baits or snoods | 60,700 | 81,600 | | 6,000 | | | |
| Pound nets | | 102 | 10 | | 96 | 78 | 76 |
| Fyke nets | | | 44 | | 42 | 176 | |
| Dip nets | | | | | | | 4 |
| Otter trawls: | | | | | | | |
| Fish | | | 1 | | | | |
| Yards at mouth | | | 20 | | | | |
| Shrimp | 1 | 13 | | | | | |
| Yards at mouth | 14 | 211 | | | | | |
| Pots, eel | | | 15 | | 22 | | 15 |
| Spears | 25 | | | 40 | | | |
| Dredges, oyster | | 141 | | | | | |
| Yards at mouth | | 113 | | | | | |
| Tongs, oyster | 60 | 14 | | | | | |

### CATCH: BY COUNTIES

| Species | Beaufort | | Bertie | | Brunswick | | Camden | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 49,700 | $497 | 1,108,000 | $11,080 | | | 9,300 | $144 |
| Bluefish | | | | | 68,000 | $3,400 | | |
| Bowfin | | | | | | | 400 | 4 |
| Carp | 68,200 | 1,364 | | | | | 4,400 | 88 |
| Catfish and bullheads | 21,700 | 217 | 17,100 | 342 | | | 4,500 | 180 |
| Croaker | 143,100 | 1,431 | | | 34,100 | 341 | | |
| Drum, red or redfish | 3,300 | 44 | | | 1,300 | 26 | | |
| Eels, common | 15,600 | 468 | | | | | | |
| Flounders | 9,700 | 485 | | | 46,600 | 2,330 | | |
| Gizzard shad | | | | | | | 1,200 | 12 |

*Fisheries of North Carolina, 1937*—Continued

CATCH: BY COUNTIES—Continued

| Species | Beaufort | | Bertie | | Brunswick | | Camden | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Harvestfish or "starfish" | 47,100 | $706 | | | | | | |
| Hickory shad | 2,100 | 42 | | | | | 2,400 | $72 |
| King whiting or "kingfish" | | | | | 42,700 | $1,281 | | |
| Menhaden | | | | | 15,135,000 | 54,864 | | |
| Mullet | 87,300 | 2,920 | | | 858,200 | 31,688 | 3,000 | 90 |
| Shad | 24,500 | 3,920 | 14,800 | $2,220 | 7,300 | 1,168 | 1,200 | 184 |
| Spadefish | 200 | 3 | | | | | | |
| Spanish mackerel | 3,000 | 150 | | | | | | |
| Spot | 3,000 | 45 | | | 472,000 | 11,800 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 298,400 | 9,252 | | | | | | |
| Spotted | 46,200 | 3,696 | | | 3,800 | 342 | | |
| Striped bass | 59,500 | 4,780 | 11,500 | 1,150 | | | 8,800 | 714 |
| Suckers | | | | | | | 1,600 | 8 |
| White perch | 10,900 | 436 | 8,100 | 333 | | | 1,100 | 55 |
| Yellow perch | | | | | | | 100 | 5 |
| Crabs, hard | 1,140.000 | 17,100 | | | 132,000 | 2,640 | | |
| Shrimp | 63,600 | 1.908 | | | 2,061,600 | 61.713 | | |
| Clams, hard, public | | | | | 3,200 | 364 | | |
| Oysters. market: | | | | | | | | |
| Public, spring | 273.900 | 16,529 | | | 4,400 | 345 | | |
| Public, fall | 527,100 | 32,010 | | | | | | |
| Total | 2,898,100 | 98,003 | 1,159,500 | 15,125 | 18,870,200 | 172,302 | 38,000 | 1,556 |

| Species | Carteret | | Chowan | | Craven | | Currituck | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 3,000 | $30 | 3,318,200 | $33,182 | 3,800 | $57 | 6,200 | $94 |
| Bluefish | 1,071,000 | 53,550 | | | | | | |
| Bonito | 900 | 14 | | | | | | |
| Bowfin | | | | | | | 1,100 | 11 |
| Butterfish | 200 | 4 | | | | | | |
| Carp | | | 3,200 | 63 | 3,400 | 68 | 111,800 | 2,236 |
| Catfish and bullheads | 300 | 12 | 47,300 | 946 | 2,000 | 40 | 25,800 | 878 |
| Cero | 200 | 8 | | | | | | |
| Croaker | 2,789,300 | 42,714 | | | 192,700 | 2,879 | 2,200 | 33 |
| Drum: | | | | | | | | |
| Black | 27,400 | 876 | | | | | | |
| Red or redfish | 293,800 | 11,696 | | | | | | |
| Eels, common | | | | | | | 64,200 | 1,664 |
| Flounders | 52,000 | 2,600 | | | | | 2,100 | 105 |
| Gizzard shad | | | | | | | 23,000 | 230 |
| Harvestfish or "starfish" | 46,600 | 932 | | | | | | |
| Hickory shad | 34,800 | 696 | 8,000 | 240 | 7,200 | 144 | 500 | 15 |
| King whiting or "kingfish" | 487,300 | 14,622 | | | | | 8,000 | 160 |
| Menhaden | 46,541,000 | 164,551 | | | | | | |
| Mullet | 1,560,000 | 46,800 | | | 46,600 | 1,864 | 1,100 | 33 |
| Pigfish | 17.600 | 263 | | | | | | |
| Pinfish or sailors choice | 37,000 | 555 | | | | | | |
| Pompano | 26,600 | 2,662 | | | | | | |
| Sea bass | 54,500 | 2,575 | | | | | | |
| Shad | 4,200 | 630 | 43,100 | 6,350 | 600 | 90 | 24,800 | 3,835 |
| Sharks | 231.600 | 772 | | | | | | |
| Sheepshead | 11,100 | 333 | | | | | | |
| Spadefish | 35,400 | 1,062 | | | | | | |
| Spanish mackerel | 128.600 | 6,430 | | | | | | |
| Spot | 1,748,200 | 26,218 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 2,583,200 | 103,358 | | | | | 2,000 | 60 |
| Spotted | 132,000 | 11,880 | | | 22,200 | 1,776 | 200 | 18 |
| Striped bass | | | 9,800 | 980 | 1,100 | 110 | 83,500 | 8,532 |
| White perch | 1.600 | 24 | 3,300 | 165 | | | 48,900 | 1,920 |
| Yellow perch | | | | | | | 3,400 | 136 |
| Crabs: | | | | | | | | |
| Hard | 602,100 | 9,329 | | | | | 94,300 | 1,213 |
| Soft and peelers | 132,600 | 21,220 | | | | | 9,200 | 1,380 |
| Shrimp | 1,956.000 | 58,677 | | | | | | |
| Clams, hard, public | 424,400 | 33,799 | | | | | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 87,500 | 3,497 | | | | | | |
| Public, fall | 156,000 | 6,494 | | | | | | |
| Private, spring | 11,500 | 431 | | | | | | |
| Private, fall | 20,100 | 780 | | | | | | |
| Scallops, bay | 61,900 | 11,680 | | | | | | |
| Turtles, snapper | | | | | | | 1,500 | 65 |
| Total | 61,371,500 | 641,774 | 3,432.900 | 41,926 | 279,600 | 7,028 | 513.800 | 22,618 |

*Fisheries of North Carolina, 1937*—Continued

CATCH: BY COUNTIES—Continued

| Species | Dare | | Gates | | Hertford | | Hyde | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 82,500 | $987 | 110,000 | $1,100 | 300,000 | $3,000 | | |
| Bluefish | 336,200 | 16,471 | | | | | 93,000 | $4,150 |
| Bowfin | 200 | 2 | | | | | | |
| Butterfish | 10,100 | 304 | | | | | | |
| Carp | 53,200 | 1,064 | | | | | | |
| Catfish and bullheads | 8,900 | 288 | | | 5,000 | 100 | | |
| Croaker | 3,294,000 | 35,476 | | | | | 1,081,400 | 10,814 |
| Drum: | | | | | | | | |
| Black | 7,000 | 70 | | | | | | |
| Red or redfish | 75,700 | 1,544 | | | | | 5,000 | 100 |
| Eels, common | 8,100 | 328 | | | | | | |
| Flounders | 122,200 | 6,110 | | | | | 10,200 | 510 |
| Gizzard shad | 400 | 4 | | | | | | |
| Harvestfish or "starfish" | 222,600 | 3,860 | | | | | 141,000 | 2,116 |
| Hickory shad | 70,100 | 2,103 | | | | | | |
| Hogfish | 10,200 | 102 | | | | | | |
| King whiting or "kingfish" | 89,800 | 2,704 | | | | | | |
| Menhaden | 30,000 | 116 | | | | | | |
| Mullet | 99,400 | 2,979 | | | | | 37,500 | 1,125 |
| Pigfish | 14,100 | 197 | | | | | | |
| Pinfish or sailors choice | 400 | 4 | | | | | | |
| Pompano | 20,700 | 2,175 | | | | | | |
| Shad | 382,600 | 58,573 | 3,300 | 495 | 7,100 | 1,065 | 3,500 | 560 |
| Sheepshead | 1,500 | 60 | | | | | | |
| Spadefish | 4,800 | 96 | | | | | | |
| Spanish mackerel | 57,400 | 2,870 | | | | | 15,300 | 765 |
| Spot | 325,000 | 4,875 | | | | | 60,600 | 908 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 2,336,800 | 54,385 | | | | | 1,005,500 | 20,290 |
| Spotted | 428,600 | 36,051 | | | | | 19,200 | 1,536 |
| Striped bass | 367,100 | 36,697 | 2,000 | 200 | 3,500 | 350 | 1,500 | 120 |
| Sturgeon | 600 | 60 | | | | | | |
| Suckers | 300 | 6 | | | | | | |
| White perch | 23,100 | 949 | 800 | 40 | | | | |
| Yellow perch | | | | | 200 | 6 | | |
| Crabs, hard | 56,800 | 849 | | | | | 350,000 | 5,249 |
| Shrimp | 33,400 | 1,002 | | | | | 4,700 | 141 |
| Oysters, market: | | | | | | | | |
| Public, spring | | | | | | | 43,700 | 2.622 |
| Public, fall | | | | | | | 62,600 | 3,906 |
| Total | 8,573,800 | 273,361 | 116,100 | 1,835 | 315,800 | 4,521 | 2,934,700 | 54,912 |

| Species | Martin | | New Hanover | | Onslow | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 109.500 | $1,095 | | | | |
| Bluefish | | | 1,000 | $50 | | |
| Carp | 1,400 | 28 | | | | |
| Catfish and bullheads | 34,300 | 686 | 2,000 | 80 | | |
| Croaker | | | 12,000 | 120 | 36,900 | $369 |
| Drum, red or redfish | | | | | 6,600 | 132 |
| Flounders | | | 16,000 | 800 | 38,100 | 1,905 |
| King whiting or "kingfish" | | | | | 76,100 | 2,283 |
| Mullet | | | 257,600 | 10,304 | 408,300 | 12,249 |
| Sea bass | | | 12,200 | 610 | 51,000 | 2,550 |
| Shad | 1,200 | 180 | 27,200 | 4,080 | | |
| Spot | | | 709,600 | 17,730 | 602,500 | 9,036 |
| Squeteagues or "sea trout": | | | | | | |
| Gray | | | | | 30,000 | 900 |
| Spotted | | | | | 72,800 | 5,824 |
| Striped bass | 1,000 | 80 | | | | |
| White perch | 25,300 | 1,012 | | | | |
| Crabs, hard | | | 120,100 | 2,402 | 240,300 | 4,806 |
| Shrimp | | | | | 12,000 | 480 |
| Clams, hard, public | | | 2,400 | 180 | | |
| Oysters, market: | | | | | | |
| Public, spring | | | 9,600 | 360 | 37,600 | 2,264 |
| Public, fall | | | 20,000 | 771 | 60,400 | 4,528 |
| Private, spring | | | | | 13,300 | 791 |
| Private, fall | | | | | 21,400 | 1,602 |
| Total | 172,700 | 3,081 | 1,189,700 | 37,487 | 1,707,300 | 49,719 |

*Fisheries of North Carolina, 1937*—Continued

CATCH: BY COUNTIES—Continued

| Species | Pamlico | | Pasquotank | | Pender | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 4,000 | $60 | 8,500 | $85 | | |
| Bluefish | 87,800 | 4,390 | | | | |
| Bowfin | | | 500 | 5 | | |
| Butterfish | 3,100 | 62 | | | | |
| Carp | | | 6,000 | 120 | | |
| Catfish and bullheads | | | 169,400 | 5,082 | | |
| Croaker | 2,362,600 | 23,626 | 39,600 | 546 | | |
| Drum: | | | | | | |
| Black | | | 200 | 6 | | |
| Red or redfish | 25,300 | 253 | 8,900 | 356 | 21,300 | $626 |
| Eels, common | | | 900 | 21 | | |
| Flounders | 44,800 | 2,240 | 30,200 | 1,510 | 22,200 | 1,110 |
| Gizzard shad | | | 6,300 | 63 | | |
| Harvestfish or "starfish" | 183,600 | 2,754 | | | | |
| Hickory shad | | | 8,000 | 239 | 4,700 | 94 |
| King whiting or "kingfish" | 4,600 | 138 | 13,600 | 408 | | |
| Mullet | 49,200 | 1,476 | 2,400 | 72 | 554,400 | 22,176 |
| Pigfish | 14,000 | 140 | 30,500 | 305 | | |
| Pike or pickerel | | | 200 | 8 | | |
| Pompano | 3,300 | 330 | | | | |
| Shad | 12,200 | 1,830 | 44,000 | 6,600 | | |
| Sheepshead | 1,200 | 48 | | | | |
| Spanish mackerel | 14,300 | 715 | | | | |
| Spot | 657,100 | 6,771 | 4,400 | 66 | 687,300 | 13,746 |
| Squeteagues or "sea trout": | | | | | | |
| Gray | 1,248,400 | 24,968 | 19,200 | 768 | | |
| Spotted | 154,000 | 10,780 | 1.500 | 150 | 19,700 | 1,576 |
| Striped bass | | | 28,800 | 2,592 | | |
| Suckers | | | 1,100 | 22 | | |
| White perch | | | 500 | 25 | | |
| Crabs, hard | 450,000 | 6,750 | | | 60,000 | 1,200 |
| Shrimp | 50,700 | 1,521 | | | 2,000 | 60 |
| Oysters, market: | | | | | | |
| Public, spring | 194,200 | 10,150 | | | 5,000 | 300 |
| Public, fall | 388,600 | 24,421 | | | 4,000 | 250 |
| Total | 5,953,000 | 123,423 | 424,700 | 19,049 | 1,380,600 | 41,138 |

| Species | Perquimans | | Tyrrell | | Washington | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 136,000 | $1,360 | 181,000 | $1,810 | 388,000 | $3,880 |
| Bowfin | 700 | 14 | 200 | 2 | | |
| Carp | 5,900 | 118 | 48,000 | 1,380 | 18,700 | 394 |
| Catfish and bullheads | 202,100 | 6,563 | 85,900 | 2,504 | 27,000 | 560 |
| Eels, common | 1,100 | 22 | | | 1,200 | 36 |
| Flounders | 9,500 | 475 | 200 | 10 | | |
| Gizzard shad | 4,400 | 44 | 2,400 | 24 | | |
| Hickory shad | 7,500 | 225 | 1,800 | 54 | 13,200 | 396 |
| Mullet | 8,200 | 246 | 700 | 21 | | |
| Pigfish | | | 4,200 | 42 | | |
| Pike or pickerel | 200 | 6 | | | | |
| Shad | 49,200 | 7,245 | 22,400 | 3,360 | 25,200 | 3,766 |
| Squeteagues or "sea trout": | | | | | | |
| Gray | | | 1,600 | 48 | | |
| Spotted | | | 900 | 72 | | |
| Striped bass | 29,100 | 2,549 | 82,300 | 8,230 | 23,400 | 2,340 |
| White perch | 2,500 | 125 | 20,300 | 797 | 15,000 | 600 |
| Yellow perch | | | 2,500 | 95 | 500 | 20 |
| Total | 456,400 | 18,992 | 454,400 | 18,449 | 512,200 | 11,992 |

SEED OYSTER FISHERY: BY GEAR

| Item | Oyster dredges | |
|---|---|---|
| OPERATING UNITS | *Number* | |
| Fishermen, on boats and shore, regular | 17 | |
| Boats, sail | 8 | |
| Apparatus, number | 14 | |
| Yards at mouth | 14 | |
| CATCH | *Bushels* | *Value* |
| Oysters, seed, public, spring | 8,000 | $1,760 |

NOTE.—Of the persons and gear employed in the seed oyster fishery all fishermen and boats are duplicated among those in the market oyster fishery or fisheries for other species. The seed oyster fishery in North Carolina is confined to Hyde County.

## SOUTH CAROLINA

### *Fisheries of South Carolina, 1937*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Gill nets | | | | Lines | | Cast nets |
|---|---|---|---|---|---|---|---|---|
| | | Anchor | Drift | Run-around | Stake | Hand | Trot with baits or snoods | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | | | 24 | | |
| On boats and shore: | | | | | | | | |
| Regular | 70 | | | 60 | | 46 | 161 | 23 |
| Casual | 76 | 255 | 64 | 30 | 34 | 29 | 12 | 2 |
| Total | 146 | 255 | 64 | 90 | 34 | 99 | 173 | 25 |
| Vessels: | | | | | | | | |
| Motor, 5 to 10 tons | | | | | | 3 | | |
| Net tonnage | | | | | | 26 | | |
| Sail, 11 to 20 tons | | | | | | 1 | | |
| Net tonnage | | | | | | 12 | | |
| Total vessels | | | | | | 4 | | |
| Total net tonnage | | | | | | 38 | | |
| Boats: | | | | | | | | |
| Motor | | 2 | | 13 | | 11 | | |
| Other | 37 | 150 | 33 | 51 | 17 | 17 | 98 | 20 |
| Accessory boats | | | | | | 12 | | |
| Apparatus: | | | | | | | | |
| Number | 39 | 195 | 33 | 51 | 17 | 123 | 98 | 25 |
| Length, yards | 5,920 | | | | | | | |
| Square yards | | 139,900 | 40,050 | 22,730 | 11,304 | | | |
| Hooks, baits, or snoods | | | | | | 222 | 49,200 | |

| Item | Otter trawls | | Pots, fish | Spears | Dredges, oyster | Grabs | By hand | | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|
| | Fish | Shrimp | | | | | Oyster | Other | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 3 | 27 | | | 3 | | | | 52 |
| On boats and shore: | | | | | | | | | |
| Regular | | 62 | | 70 | | 135 | 238 | 5 | 635 |
| Casual | | | 12 | 25 | | | 87 | 26 | 613 |
| Total | 3 | 89 | 12 | 95 | 3 | 135 | 325 | 31 | 1,300 |
| Vessels, motor: | | | | | | | | | |
| 5 to 10 tons | 1 | 7 | | | 1 | | | | 11 |
| 11 to 20 tons | | 1 | | | | | | | 1 |
| 21 to 30 tons | | 2 | | | | | | | 2 |
| Total | 1 | 10 | | | 1 | | | | 14 |
| Net tonnage | 10 | 126 | | | 6 | | | | 158 |
| Sail, 11–20 tons | | | | | | | | | 1 |
| Net tonnage | | | | | | | | | 12 |
| Total vessels | 1 | 10 | | | 1 | | | | 15 |
| Total net tonnage | 10 | 126 | | | 6 | | | | 170 |
| Boats: | | | | | | | | | |
| Motor | | 29 | | | | | | | 55 |
| Other | | | 6 | 70 | | 135 | 147 | 11 | 668 |
| Accessory boats | | | | | | | | | 12 |
| Apparatus: | | | | | | | | | |
| Number | 1 | 39 | 76 | 95 | 1 | 135 | | | |
| Yards at mouth | 23 | 795 | | | 2 | | | | |

*Fisheries of South Carolina, 1937*—Continued

CATCH: BY GEAR

| Species | Haul seines | | Gill nets | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Anchor | | Drift | | Runaround | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 1,500 | $120 | | | | | 1,200 | $96 |
| Drum: | | | | | | | | |
| Black | 28,000 | 1,000 | | | | | 6,000 | 280 |
| Red or redfish | 70,000 | 3,120 | | | | | 48,500 | 3,135 |
| Flounders | | | | | | | 2,500 | 150 |
| Hickory shad | | | | | 1,200 | $18 | | |
| King whiting or "kingfish" | 61,000 | 1,740 | | | | | | |
| Mullet | 462,000 | 16,250 | | | | | 165,000 | 6,000 |
| Shad | 800 | 150 | 68,800 | $16,652 | 20,900 | 4,920 | | |
| Sheepshead | | | | | | | 5,000 | 100 |
| Spot | 206,500 | 5,515 | | | | | 38,500 | 1,140 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | | | | | 3,500 | 245 |
| Spotted | 51,000 | 4,570 | | | | | 17,500 | 1,660 |
| Sturgeon | | | | | 24,700 | 2,027 | | |
| Terrapin, diamond-back | 4,900 | 493 | | | | | | |
| Total | 885,700 | 32,958 | 68,800 | 16,652 | 46,800 | 6,965 | 287,700 | 12,806 |

| Species | Gill nets—Continued | | Lines | | | | Cast nets | |
|---|---|---|---|---|---|---|---|---|
| | Stake | | Hand | | Trot with baits or snoods | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | | | 27,100 | $2,147 | | | | |
| Grunts | | | 5,000 | 150 | | | | |
| Hickory shad | 4,100 | $84 | | | | | | |
| King whiting or "kingfish" | | | 42,000 | 2,100 | | | | |
| Sea bass | | | 233,200 | 13,100 | | | | |
| Sea catfish | | | 120,000 | 3,600 | | | | |
| Shad | 47,100 | 8,028 | | | | | | |
| Sharks | | | 15,000 | 150 | | | | |
| Squeteagues or "sea trout," spotted | | | 12,500 | 1,000 | | | | |
| Crabs, hard | | | | | 1,226,500 | $18,408 | | |
| Shrimp | | | | | | | 49,000 | $1,470 |
| Total | 51,200 | 8,112 | 454,800 | 22,247 | 1,226,500 | 18,408 | 49,000 | 1,470 |

| Species | Otter trawls | | Pots | | Spears | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Butterfish | 200 | $6 | | | | |
| Catfish and bullheads | | | 51,000 | $1,865 | | |
| Croaker | 900 | 16 | | | | |
| Flounders | 19,900 | 2,055 | | | 35,300 | $2,968 |
| King whiting or "kingfish" | 3,400 | 52 | | | | |
| Porgies | 1,900 | 32 | | | | |
| Sea bass | 800 | 80 | | | | |
| Squeteagues or "sea trout," gray | 2,200 | 26 | | | | |
| Shrimp | 1,151,700 | 34,551 | | | | |
| Total | 1,181,000 | 36,818 | 51,000 | 1,865 | 35,300 | 2,968 |

| Species | Dredges | | Grabs | | By hand | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs, soft and peelers | | | | | 8,300 | $1,230 |
| Clams, hard, public | | | | | 7,900 | 491 |
| Oysters, market: | | | | | | |
| Private, spring | 25,300 | $949 | 860,800 | $32,471 | 612,000 | 21,697 |
| Private, fall | 17,800 | 670 | 751,600 | 28,337 | 544,100 | 20,594 |
| Total | 43,100 | 1,619 | 1,612,400 | 60,808 | 1,172,300 | 44,012 |

## *Fisheries of South Carolina, 1937*—Continued

### OPERATING UNITS: BY COUNTIES

| Item | Beaufort | Charleston | Colleton | Georgetown | Horry | Jasper |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 5 | 45 |  | 2 |  |  |
| On boats and shore: |  |  |  |  |  |  |
| Regular | 295 | 209 |  | 70 | 34 | 27 |
| Casual | 103 | 117 | 66 | 256 | 71 |  |
| Total | 403 | 371 | 66 | 328 | 105 | 27 |
| Vessels: |  |  |  |  |  |  |
| Motor: |  |  |  |  |  |  |
| 5 to 10 tons | 2 | 8 |  | 1 |  |  |
| 11 to 20 tons |  | 1 |  |  |  |  |
| 21 to 30 tons |  | 2 |  |  |  |  |
| Total | 2 | 11 |  | 1 |  |  |
| Net tonnage | 15 | 134 |  | 9 |  |  |
| Sail, 11 to 20 tons |  | 1 |  |  |  |  |
| Net tonnage |  | 12 |  |  |  |  |
| Total vessels | 2 | 12 |  | 1 |  |  |
| Total net tonnage | 15 | 146 |  | 9 |  |  |
| Boats: |  |  |  |  |  |  |
| Motor | 13 | 21 |  | 18 | 2 | 1 |
| Other | 242 | 181 | 33 | 148 | 48 | 16 |
| Accessory boats |  | 12 |  |  |  |  |
| Apparatus: |  |  |  |  |  |  |
| Haul seines | 2 | 5 |  | 17 | 15 |  |
| Length, yards | 400 | 600 |  | 2,140 | 2,780 |  |
| Gill nets: |  |  |  |  |  |  |
| Anchor | 49 | 52 | 53 | 41 |  |  |
| Square yards | 7,350 | 34,550 | 34,800 | 63,200 |  |  |
| Drift |  |  | 4 | 29 |  |  |
| Square yards |  |  | 2,350 | 37,700 |  |  |
| Runaround | 1 | 4 |  | 33 | 12 | 1 |
| Square yards | 600 | 1,370 |  | 17,160 | 3,000 | 600 |
| Stake |  |  |  | 9 | 8 |  |
| Square yards |  |  |  | 9,084 | 2,220 |  |
| Lines: |  |  |  |  |  |  |
| Hand |  | 99 |  | 9 | 15 |  |
| Hooks |  | 150 |  | 27 | 45 |  |
| Trot with baits or snoods | 58 | 40 |  |  |  |  |
| Baits or snoods | 30,400 | 18,800 |  |  |  |  |
| Cast nets |  | 25 |  |  |  |  |
| Otter trawls: |  |  |  |  |  |  |
| Fish | 1 |  |  |  |  |  |
| Yards at mouth | 23 |  |  |  |  |  |
| Shrimp | 14 | 18 |  | 7 |  |  |
| Yards at mouth | 280 | 386 |  | 129 |  |  |
| Pots, fish | 50 |  |  | 26 |  |  |
| Spears | 35 | 10 |  | 45 | 5 |  |
| Dredges, oyster |  | 1 |  |  |  |  |
| Yards at mouth |  | 2 |  |  |  |  |
| Grabs | 78 | 57 |  |  |  |  |

*Fisheries of South Carolina, 1937*—Continued

CATCH: BY COUNTIES

| Species | Beaufort | | Charleston | | Colleton | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | - | - | 27,100 | $2,147 | - | - |
| Butterfish | 200 | $6 | - | - | - | - |
| Catfish and bullheads | 16,000 | 640 | - | - | - | - |
| Croaker | 900 | 16 | - | - | - | - |
| Drum: | | | | | | |
| Black | 20,000 | 600 | 2,000 | 80 | - | - |
| Red or redfish | 51,000 | 2,050 | 30,000 | 2,100 | - | - |
| Flounders | 31,900 | 3,135 | 4,500 | 270 | - | - |
| Grunts | - | - | 5,000 | 150 | - | - |
| King whiting or "kingfish" | 38,400 | 752 | 42,000 | 2,100 | - | - |
| Mullet | 26,000 | 820 | 12,000 | 480 | - | - |
| Porgies | 1,900 | 32 | - | - | - | - |
| Sea bass | 800 | 80 | 214,200 | 11,310 | - | - |
| Sea catfish | - | - | 120,000 | 3,600 | - | - |
| Shad | 4,000 | 800 | 15,800 | 3,150 | 16,200 | $3,240 |
| Sharks | - | - | 15,000 | 150 | - | - |
| Sheepshead | - | - | 5,000 | 100 | - | - |
| Spot | 6,000 | 130 | 1,500 | 30 | - | - |
| Squeteagues or "sea trout": | | | | | | |
| Gray | 2,200 | 26 | - | - | - | - |
| Spotted | 43,500 | 3,940 | 18,500 | 1,600 | - | - |
| Sturgeon | - | - | - | - | 1,700 | 187 |
| Crabs: | | | | | | |
| Hard | 838,500 | 12,574 | 388,000 | 5,834 | - | - |
| Soft and peelers | - | - | 8,300 | 1,230 | - | - |
| Shrimp | 400,600 | 12,018 | 678,400 | 20,352 | - | - |
| Clams, hard, public | - | - | 1,800 | 114 | - | - |
| Oysters, market: | | | | | | |
| Private, spring | 863,000 | 32,049 | 587,400 | 21,280 | - | - |
| Private, fall | 670,100 | 25,468 | 607,200 | 22,775 | - | - |
| Terrapin, diamond-back | - | - | 4,900 | 493 | - | - |
| Total | 3,015,000 | 95,136 | 2,788,600 | 99,345 | 17,900 | 3,427 |

| Species | Georgetown | | Horry | | Jasper | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 2,700 | $216 | - | - | - | - |
| Catfish and bullheads | 35,000 | 1,225 | - | - | - | - |
| Drum: | | | | | | |
| Black | 12,000 | 600 | - | - | - | - |
| Red or redfish | 35,500 | 2,005 | - | - | 2,000 | $100 |
| Flounders | 20,000 | 1,690 | 1,300 | $78 | - | - |
| Hickory shad | 3,800 | 57 | 1,500 | 45 | - | - |
| King whiting or "kingfish" | - | - | 26,000 | 1,040 | - | - |
| Mullet | 412,000 | 14,730 | 171,000 | 5,980 | 6,000 | 240 |
| Sea bass | 8,000 | 800 | 11,000 | 990 | - | - |
| Shad | 94,900 | 21,220 | 6,700 | 1,340 | - | - |
| Spot | 152,000 | 4,240 | 83,500 | 2,195 | 2,000 | 60 |
| Squeteagues or "sea trout": | | | | | | |
| Gray | 3,500 | 245 | - | - | - | - |
| Spotted | 15,000 | 1,350 | 3,000 | 240 | 1,000 | 100 |
| Sturgeon | 23,000 | 1,840 | - | - | - | - |
| Shrimp | 121,700 | 3,651 | - | - | - | - |
| Clams, hard, public | - | - | 6,100 | 377 | - | - |
| Oysters, market: | | | | | | |
| Private, spring | 10,600 | 398 | - | - | 37,100 | 1,390 |
| Private, fall | 2,800 | 105 | - | - | 33,400 | 1,253 |
| Total | 952,500 | 54,372 | 310,100 | 12,285 | 81,500 | 3,143 |

## GEORGIA

### *Fisheries of Georgia, 1937*

OPERATING UNITS: BY GEAR

| Item | Purse seines, menhaden | Haul seines | Gill nets | | | | Lines | |
|---|---|---|---|---|---|---|---|---|
| | | | Anchor | Drift | Run-around | Stake | Hand | Trot with baits or snoods |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 48 | | | | | | | |
| On boats and shore: | | | | | | | | |
| Regular | | 18 | | 18 | 18 | | 12 | 217 |
| Casual | | 4 | 14 | 290 | 16 | 92 | 50 | 25 |
| Total | 48 | 22 | 14 | 308 | 34 | 92 | 62 | 242 |
| Vessels, motor: | | | | | | | | |
| 21 to 30 tons | 1 | | | | | | | |
| 61 to 70 tons | 1 | | | | | | | |
| Total | 2 | | | | | | | |
| Net tonnage | 92 | | | | | | | |
| Boats: | | | | | | | | |
| Motor | | | | 11 | 7 | | | 20 |
| Other | | 11 | 7 | 148 | 24 | 52 | 39 | 171 |
| Accessory boats | 6 | | | | | | | |
| Apparatus: | | | | | | | | |
| Number | 2 | 11 | 34 | 159 | 34 | 216 | 310 | 232 |
| Length, yards | 600 | 992 | | | | | | |
| Square yards | | | 1,530 | 75,015 | 13,200 | 21,904 | | |
| Hooks, baits, or snoods | | | | | | | 310 | 99,250 |

| Item | Lines—Contd. | Otter trawls, shrimp | Pots | | Tongs, oyster | Grabs | By hand | | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|
| | Trot with hooks | | Crab | Fish | | | Oyster | Other | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | 139 | | | | | | | 187 |
| On boats and shore: | | | | | | | | | |
| Regular | | 366 | 69 | 6 | 10 | 15 | 10 | | 702 |
| Casual | 42 | | | 8 | 17 | 20 | 20 | 20 | 543 |
| Total | 42 | 505 | 69 | 14 | 27 | 35 | 30 | 20 | 1,432 |
| Vessels, motor: | | | | | | | | | |
| 5 to 10 tons | | 61 | | | | | | | 61 |
| 11 to 20 tons | | 5 | | | | | | | 5 |
| 21 to 30 tons | | | | | | | | | 1 |
| 61 to 70 tons | | | | | | | | | 1 |
| Total | | 66 | | | | | | | 68 |
| Net tonnage | | 480 | | | | | | | 572 |
| Boats: | | | | | | | | | |
| Motor | | 179 | 2 | 10 | | | | | 227 |
| Other | 36 | | 54 | 4 | 27 | 35 | 30 | | 548 |
| Accessory boats | | | | | | | | | 6 |
| Apparatus: | | | | | | | | | |
| Number | 91 | 245 | 655 | 84 | 27 | 35 | | | |
| Yards at mouth | | 4,686 | | | | | | | |
| Hooks, baits, or snoods | 10,900 | | | | | | | | |

## *Fisheries of Georgia, 1937*—Continued

### CATCH: BY GEAR

| Species | Purse seines | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Anchor | | Drift | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Hickory shad | | | | | | | 12,900 | $375 |
| Menhaden | 9,864,000 | $23,330 | | | | | | |
| Mullet | | | 2,000 | $40 | | | | |
| Shad | | | | | 6,000 | $1,050 | 156,600 | 25,488 |
| Spot | | | 2,000 | 30 | | | | |
| Squeteagues or "sea trout," spotted | | | 5,000 | 450 | | | | |
| Sturgeon | | | | | | | 7,600 | 1,309 |
| Terrapin, diamond-back | | | 7,500 | 775 | | | | |
| Total | 9,864,000 | 23,330 | 16,500 | 1,295 | 6,000 | 1,050 | 177,100 | 27,172 |

| Species | Gill nets—Continued | | | | Lines | | | |
|---|---|---|---|---|---|---|---|---|
| | Runaround | | Stake | | Hand | | Trot with baits or snoods | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | 3,000 | $120 | | | | | | |
| Drum: | | | | | | | | |
| Black | 7,000 | 280 | | | | | | |
| Red or redfish | 37,500 | 1,960 | | | | | | |
| Hickory shad | | | 500 | $17 | | | | |
| King whiting or "kingfish" | 6,000 | 90 | | | | | | |
| Mullet | 16,000 | 400 | | | | | | |
| Shad | | | 30,500 | 5,505 | | | | |
| Sheepshead | 8,000 | 240 | | | | | | |
| Spot | 3,000 | 45 | | | | | | |
| Squeteagues or "sea trout," spotted | 60,000 | 5,400 | | | | | | |
| Crabs, hard | | | | | 141,400 | $2,121 | 1,711,000 | $26,215 |
| Total | 140,500 | 8,535 | 31,000 | 5,522 | 141,400 | 2,121 | 1,711,000 | 26,215 |

| Species | Lines—Continued | | Otter trawls | | Pots | |
|---|---|---|---|---|---|---|
| | Trot with hooks | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Catfish and bullheads | 22,500 | $1,275 | | | 68,000 | $3,400 |
| Eels, common | | | | | 4,000 | 480 |
| Flounders | | | 14,100 | $705 | | |
| King whiting or "kingfish" | | | 95,600 | 1,425 | | |
| Crabs, hard | | | 12,500 | 188 | 393,000 | 5,897 |
| Shrimp | | | 9,503,900 | 284,065 | | |
| Total | 22,500 | 1,275 | 9,626,100 | 286,383 | 465,000 | 9,777 |

| Species | Tongs | | Grabs | | By hand | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Oysters, market: | | | | | | |
| Private, spring | 42,900 | $2,284 | 43,200 | $2,472 | 48,200 | $2,329 |
| Private, fall | 28,900 | 1,495 | 35,000 | 2,000 | 40,800 | 1,996 |
| Terrapin, diamond-back | | | | | 2,500 | 325 |
| Total | 71,800 | 3,779 | 78,200 | 4,472 | 91,500 | 4,650 |

## *Fisheries of Georgia, 1937*—Continued

### OPERATING UNITS: BY COUNTIES

| Item | Bryan | Bullock | Camden | Charlton | Chatham | Effingham |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels |  |  | 64 |  | 52 |  |
| On boats and shore: |  |  |  |  |  |  |
| Regular |  |  | 102 |  | 141 |  |
| Casual | 52 | 24 | 20 | 12 | 188 | 14 |
| Total | 52 | 24 | 186 | 12 | 381 | 14 |
| Vessels, motor: |  |  |  |  |  |  |
| 5 to 10 tons |  |  | 6 |  | 22 |  |
| 11 to 20 tons |  |  | 2 |  | 1 |  |
| 21 to 30 tons |  |  | 1 |  |  |  |
| 61 to 70 tons |  |  | 1 |  |  |  |
| Total |  |  | 10 |  | 23 |  |
| Net tonnage |  |  | 163 |  | 177 |  |
| Boats: |  |  |  |  |  |  |
| Motor |  |  | 22 |  | 56 |  |
| Other | 26 | 12 | 70 | 6 | 146 | 7 |
| Accessory boats |  |  | 6 |  |  |  |
| Apparatus: |  |  |  |  |  |  |
| Purse seines, menhaden |  |  | 2 |  |  |  |
| Length, yards |  |  | 600 |  |  |  |
| Haul seines |  |  |  |  | 6 |  |
| Length, yards |  |  |  |  | 492 |  |
| Gill nets: |  |  |  |  |  |  |
| Anchor |  |  |  |  |  | 34 |
| Square yards |  |  |  |  |  | 1,530 |
| Drift | 19 |  | 8 |  | 54 |  |
| Square yards | 8,550 |  | 4,480 |  | 18,480 |  |
| Runaround |  |  |  |  | 14 |  |
| Square yards |  |  |  |  | 7,000 |  |
| Stake | 14 | 120 | 6 | 6 |  |  |
| Square yards | 4,100 | 4,800 | 7,200 | 3,360 |  |  |
| Lines: |  |  |  |  |  |  |
| Hand |  |  |  |  | 310 |  |
| Hooks |  |  |  |  | 310 |  |
| Trot with baits or snoods |  |  | 55 |  | 24 |  |
| Baits or snoods |  |  | 27,500 |  | 7,200 |  |
| Trot with hooks |  | 25 |  |  |  |  |
| Hooks |  | 2,500 |  |  |  |  |
| Otter trawls, shrimp |  |  | 26 |  | 72 |  |
| Yards at mouth |  |  | 122 |  | 1,445 |  |
| Pots, crab |  |  | 50 |  | 158 |  |
| Tongs, oyster |  |  |  |  | 19 |  |

| Item | Glynn | Liberty | Long | McIntosh | Screven | Tattnall | Wayne |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 67 |  |  | 4 |  |  |  |
| On boats and shore: |  |  |  |  |  |  |  |
| Regular | 190 | 49 |  | 220 |  |  |  |
| Casual | 67 | 15 | 8 | 70 | 12 | 42 | 19 |
| Total | 324 | 64 | 8 | 294 | 12 | 42 | 19 |
| Vessels, motor: |  |  |  |  |  |  |  |
| 5 to 10 tons | 31 |  |  | 2 |  |  |  |
| 11 to 20 tons | 2 |  |  |  |  |  |  |
| Total | 33 |  |  | 2 |  |  |  |
| Net tonnage | 220 |  |  | 12 |  |  |  |
| Boats: |  |  |  |  |  |  |  |
| Motor | 71 |  |  | 69 |  | 7 | 2 |
| Other | 87 | 39 | 5 | 115 | 12 | 14 | 9 |
| Apparatus: |  |  |  |  |  |  |  |
| Haul seines | 5 |  |  |  |  |  |  |
| Length, yards | 500 |  |  |  |  |  |  |
| Gill nets: |  |  |  |  |  |  |  |
| Drift | 29 |  | 3 | 24 |  | 15 | 7 |
| Square yards | 21,050 |  | 400 | 16,390 |  | 5,125 | 560 |
| Runaround | 26 |  |  |  |  |  |  |
| Square yards | 6,200 |  |  |  |  |  |  |
| Stake |  |  | 8 |  | 24 | 16 | 2 |
| Square yards |  |  | 480 |  | 1,200 | 800 | 64 |

## *Fisheries of Georgia, 1937*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Glynn | Liberty | Long | McIntosh | Screven | Tattnall | Wayne |
|---|---|---|---|---|---|---|---|
| Apparatus—Continued | | | | | | | |
| Lines: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Trot with baits or snoods | 32 | 45 | | 54 | | | |
| Baits or snoods | 25,800 | 13,500 | | 22,250 | | | |
| Trot with hooks | | | 5 | | 5 | 40 | 12 |
| Hooks | | | 500 | | 500 | 6,000 | 1,200 |
| Otter trawls, shrimp | 54 | | | 41 | | | |
| Yards at mouth | 1,549 | | | 1,177 | | | |
| Pots: | | | | | | | |
| Crab | 250 | 50 | | 85 | | | |
| Fish | | | | 84 | | | |
| Tongs, oyster | 4 | | | 4 | | | |
| Grabs | | | | 35 | | | |

CATCH: BY COUNTIES

| Species | Bryan | | Bullock | | Camden | | Charlton | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Catfish and bullheads | | | 2,000 | $100 | | | | |
| Menhaden | | | | | 9,864,000 | $22,330 | | |
| Shad | 27,000 | $4,950 | 3,300 | 660 | 17,900 | 2,685 | 7,500 | $1,125 |
| Sturgeon | | | | | 1,200 | 130 | | |
| Crabs, hard | | | | | 300,000 | 4,500 | | |
| Shrimp | | | | | 1,479,800 | 44,402 | | |
| Total | 27,000 | 4,950 | 5,300 | 760 | 11,662,900 | 73,847 | 7,500 | 1,125 |

| Species | Chatham | | Effingham | | Glynn | | Liberty | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | | | | | 3,000 | $120 | | |
| Drum: | | | | | | | | |
| Black | | | | | 7,000 | 280 | | |
| Red or redfish | 6,500 | $520 | | | 29,000 | 1,450 | | |
| Flounders | 6,200 | 465 | | | 4,800 | 240 | | |
| Hickory shad | 5,000 | 150 | | | 4,000 | 80 | | |
| King whiting or "kingfish" | 65,900 | 940 | | | 34,500 | 525 | | |
| Mullet | 8,000 | 240 | | | 10,000 | 200 | | |
| Shad | 72,900 | 12,200 | 6,000 | $1,050 | 35,400 | 7,080 | | |
| Sheepshead | | | | | 6,000 | 240 | | |
| Spot | 3,000 | 45 | | | 2,000 | 30 | | |
| Squeteagues or "sea trout," spotted | 40,700 | 3,400 | | | 25,000 | 2,250 | | |
| Sturgeon | 300 | 22 | | | | | | |
| Crabs, hard | 464,300 | 4,517 | | | 735,800 | 12,397 | 181,800 | $2,757 |
| Shrimp | 3,067,100 | 91,912 | | | 2,944,600 | 85,166 | | |
| Oysters, market: | | | | | | | | |
| Private, spring | 65,700 | 1,287 | | | 5,000 | 298 | 8,900 | 262 |
| Private, fall | 61,400 | 1,781 | | | 4,500 | 275 | 3,600 | 135 |
| Terrapin, diamond-back | 5,700 | 400 | | | 3,000 | 450 | | |
| Total | 3,575,400 | 124,060 | 6,000 | 1,050 | 3,841,400 | 108,898 | 194,300 | 3,154 |

| Species | Long | | McIntosh | | Screven | | Tattnall | | Wayne | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Catfish and bullheads | 1,500 | $100 | 68,000 | $3,400 | 1,500 | $90 | 10,000 | $500 | 7,500 | $455 |
| Eels, common | | | 4,000 | 480 | | | | | | |
| Hickory shad | 200 | 4 | 800 | 26 | | | | | 2,400 | 125 |
| Shad | 2,000 | 400 | 8,700 | 1,692 | 3,300 | 600 | 6,500 | 1,300 | 5,800 | 1,227 |
| Sturgeon | | | 6,400 | 1,150 | | | | | 100 | 27 |
| Crabs, hard | | | 530,000 | 7,950 | | | | | | |
| Shrimp | | | 2,062,400 | 61,572 | | | | | | |
| Oysters, market: | | | | | | | | | | |
| Private, spring | | | 53,700 | 3,243 | | | | | | |
| Private, fall | | | 23,000 | 2,000 | | | | | | |
| Total | 3,700 | 504 | 2,781,000 | 81,671 | 4,800 | 690 | 16,500 | 1,800 | 15,800 | 1,837 |

## FLORIDA

### *Fisheries of Florida, 1937*

OPERATING UNITS: BY GEAR

| Item | Purse seines, menhaden | Haul seines | Gill nets |  |  |  | Trammel nets | Lines |
|---|---|---|---|---|---|---|---|---|
|  |  |  | Anchor | Drift | Run-around | Stake |  | Hand |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 412 |  | 2 |  | 3 |  |  | 503 |
| On boats and shore: |  |  |  |  |  |  |  |  |
| Regular |  | 1,010 | 31 | 134 | 2,439 | 2 | 781 | 786 |
| Casual |  | 173 |  | 12 | 112 | 12 | 26 | 587 |
| Total | 412 | 1,183 | 33 | 146 | 2,554 | 14 | 807 | 1,876 |
| Vessels, motor: |  |  |  |  |  |  |  |  |
| 5 to 10 tons |  |  |  |  | 1 |  |  | 23 |
| 11 to 20 tons |  |  | 1 |  |  |  |  | 16 |
| 21 to 30 tons |  |  |  |  |  |  |  | 4 |
| 31 to 40 tons | 11 |  |  |  |  |  |  |  |
| 41 to 50 tons | 4 |  |  |  |  |  |  | 6 |
| 51 to 60 tons | 2 |  |  |  |  |  |  | 3 |
| 61 to 70 tons | 1 |  |  |  |  |  |  | 10 |
| 71 to 80 tons | 1 |  |  |  |  |  |  | 4 |
| 81 to 90 tons | 1 |  |  |  |  |  |  | 1 |
| 91 to 100 tons |  |  |  |  |  |  |  | 1 |
| Total | 20 |  | 1 |  | 1 |  |  | 68 |
| Net tonnage | 905 |  | 15 |  | 10 |  |  | 2,033 |
| Boats: |  |  |  |  |  |  |  |  |
| Motor |  | 275 | 15 | 59 | 1,080 | 2 | 325 | 598 |
| Other |  | 311 | 15 | 72 | 1,871 | 6 | 421 | 219 |
| Accessory boats | 60 |  |  |  |  |  |  | 1 |
| Apparatus: |  |  |  |  |  |  |  |  |
| Number | 20 | 277 | 26 | 93 | 2,161 | 8 | 566 | 1,889 |
| Length, yards | 5,670 | 156,745 |  |  |  |  |  |  |
| Square yards |  |  | 22,380 | 139,400 | 2,233,076 | 7,600 | 557,400 |  |
| Hooks, baits, or snoods |  |  |  |  |  |  |  | 2,522 |

| Item | Lines-Continued |  |  |  | Pound nets | Fyke nets | Dip nets |  | Cast nets | Otter trawls |
|---|---|---|---|---|---|---|---|---|---|---|
|  | Trawl | Troll | Trot with baits or snoods | Trot with hooks |  |  | Common | Drop |  | Fish |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 2 |  |  |  |  |  |  |  |  | 11 |
| On boats and shore: |  |  |  |  |  |  |  |  |  |  |
| Regular | 12 | 626 | 176 | 189 | 12 | 2 | 50 |  | 196 | 2 |
| Casual |  | 227 | 27 | 48 |  |  | 46 | 4 | 36 |  |
| Total | 14 | 853 | 203 | 237 | 12 | 2 | 96 | 4 | 232 | 13 |
| Vessels, motor: |  |  |  |  |  |  |  |  |  |  |
| 5 to 10 tons |  |  |  |  |  |  |  |  |  | 2 |
| 11 to 20 tons | 1 |  |  |  |  |  |  |  |  | 2 |
| Total | 1 |  |  |  |  |  |  |  |  | 4 |
| Net tonnage | 15 |  |  |  |  |  |  |  |  | 47 |
| Boats: |  |  |  |  |  |  |  |  |  |  |
| Motor | 6 | 419 | 102 | 91 | 9 | 1 | 13 |  | 10 | 1 |
| Other |  | 1 | 74 | 146 | 1 |  | 29 | 1 | 80 |  |
| Apparatus: |  |  |  |  |  |  |  |  |  |  |
| Number | 15 | 993 | 212 | 237 | 21 | 8 | 83 | 26 | 232 | 5 |
| Yards at mouth |  |  |  |  |  |  |  |  |  | 122 |
| Hooks, baits, or snoods | 800 | 993 | 95,900 | 81,850 |  |  |  |  |  |  |

## *Fisheries of Florida, 1937*—Continued

### OPERATING UNITS: BY GEAR—Continued

| Item | Otter trawls—Contd. | Pots | | | | Spears | Dredges | | | Tongs, oyster |
|---|---|---|---|---|---|---|---|---|---|---|
| | Shrimp | Crab | Eel | Fish | Sea crawfish | | Clam | Oyster | Scallop | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 413 | | | | | | | | | |
| On boats and shore: | | | | | | | | | | |
| Regular | 292 | 85 | 3 | 48 | 43 | 39 | 12 | 9 | 27 | 301 |
| Casual | 10 | 17 | | | 1 | 45 | | | | 78 |
| Total | 715 | 102 | 3 | 48 | 44 | 84 | 12 | 9 | 27 | 379 |
| Vessels, motor: | | | | | | | | | | |
| 5 to 10 tons | 149 | | | | | | | | | |
| 11 to 20 tons | 19 | | | | | | | | | |
| 21 to 30 tons | 1 | | | | | | | | | |
| Total | 169 | | | | | | | | | |
| Net tonnage | 1,305 | | | | | | | | | |
| Boats: | | | | | | | | | | |
| Motor | 149 | 53 | 3 | 21 | 33 | | | 3 | 17 | 88 |
| Other | | 5 | | 26 | | 18 | | | 6 | 199 |
| Apparatus: | | | | | | | | | | |
| Number | 318 | 5,783 | 90 | 4,920 | 2,075 | 84 | 1 | 3 | 37 | 315 |
| Yards at mouth | 6,163 | | | | | | | 3 | 27 | |

| Item | Rakes, oyster | Forks | Grabs | Coquina scoops | Hooks | | Diving outfits | By hand | | Total exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sponge | Conch | | Oysters | Other | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | 2 | | | | 49 | | | 1,369 |
| On boats and shore: | | | | | | | | | | |
| Regular | | 5 | 14 | | 380 | 2 | 520 | 34 | 28 | 5,853 |
| Casual | 1 | 7 | 2 | 3 | | 1 | | 9 | 44 | 1,372 |
| Total | 1 | 12 | 18 | 3 | 380 | 3 | 569 | 43 | 72 | 8,594 |
| Vessels, motor: | | | | | | | | | | |
| 5 to 10 tons | | | 1 | | | | 4 | | | 173 |
| 11 to 20 tons | | | | | | | 3 | | | 38 |
| 21 to 30 tons | | | | | | | | | | 5 |
| 31 to 40 tons | | | | | | | | | | 11 |
| 41 to 50 tons | | | | | | | | | | 10 |
| 51 to 60 tons | | | | | | | | | | 5 |
| 61 to 70 tons | | | | | | | | | | 11 |
| 71 to 80 tons | | | | | | | | | | 5 |
| 81 to 90 tons | | | | | | | | | | 2 |
| 91 to 100 tons | | | | | | | | | | 1 |
| Total | | | 1 | | | | 7 | | | 261 |
| Net tonnage | | | 6 | | | | 75 | | | 4,307 |
| Boats: | | | | | | | | | | |
| Motor | | | 6 | | | | 65 | | | 2,331 |
| Other | 1 | | 8 | | 256 | 3 | | 39 | | 3,196 |
| Accessory boats | | | | | | | | | | 61 |
| Apparatus, number | 1 | 9 | 11 | 2 | 256 | 3 | 72 | | | |

## *Fisheries of Florida, 1937*—Continued

### CATCH: BY GEAR

| Species | Purse seines | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Anchor | | Drift | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 400,000 | $1,999 | | | | |
| Amberjack | | | 2,000 | 45 | | | | |
| Bluefish | | | 562,200 | 18,493 | | | 18,500 | $1,070 |
| Blue runner or hardtail | | | 633,000 | 6,434 | | | | |
| Catfish and bullheads | | | 2,820,600 | 105,601 | | | | |
| Cigarfish | | | 16,800 | 341 | | | | |
| Crappie | | | 350,100 | 11,849 | | | | |
| Crevalle | | | 72,900 | 1,088 | | | | |
| Croaker | | | 23,400 | 370 | | | | |
| Drum: | | | | | | | | |
| Black | | | 50,600 | 1,096 | | | | |
| Red or redfish | | | 173,500 | 6,177 | | | | |
| Flounders | | | 32,500 | 1,331 | | | | |
| Groupers | | | 500 | 15 | | | | |
| Grunts | | | 3,000 | 60 | | | | |
| Hickory shad | | | 51,000 | 1,520 | | | | |
| Jewfish | | | 11,400 | 341 | | | | |
| Kingfish or "king mackerel" | | | 42,900 | 858 | | | | |
| King whiting or "kingfish" | | | 81,400 | 1,235 | | | | |
| Menhaden | 139,679,000 | $371,298 | 109,000 | 1,672 | | | | |
| Mojarra | | | 87,600 | 1,779 | | | | |
| Mullet | | | 6,622,600 | 211,425 | | | | |
| Permit | | | 3,600 | 103 | | | | |
| Pigfish | | | 26,200 | 407 | | | | |
| Pinfish or sailors choice | | | 2,000 | 30 | | | | |
| Pompano | | | 51,200 | 10,825 | | | | |
| Sea catfish | | | 11,700 | 170 | | | | |
| Shad | | | 170,100 | 11,746 | 6,300 | $693 | 105,400 | 10,441 |
| Sharks | | | | | 670,000 | 4,374 | | |
| Sheepshead | | | 165,700 | 4,227 | | | | |
| Skates | | | 3,000 | 15 | | | | |
| Snapper, mangrove | | | 36,000 | 1,139 | | | | |
| Snook or sergeantfish | | | 96,400 | 3,783 | | | | |
| Spadefish | | | 1,800 | 42 | | | | |
| Spanish mackerel | | | 810,100 | 27,282 | | | 11,500 | 518 |
| Spot | | | 68,400 | 1,169 | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | | | 469,000 | 29,328 | | | | |
| White | | | 37,500 | 1,782 | | | | |
| Sturgeon | | | | | 12,000 | 1,200 | 19,200 | 1,921 |
| Sunfish | | | 823,300 | 23,622 | | | | |
| Tenpounder | | | 418,400 | 7,620 | | | | |
| Tripletail | | | 22,200 | 335 | | | | |
| Turtles: | | | | | | | | |
| Green | | | | | 10,000 | 400 | | |
| Soft-shell | | | 105,900 | 2,089 | | | | |
| Total | 139,679,000 | 371,298 | 15,469,500 | 499,443 | 698,300 | 6,667 | 154,600 | 13,95 |

| Species | Gill nets—Continued | | | | Trammel nets | | Lines | |
|---|---|---|---|---|---|---|---|---|
| | Runaround | | Stake | | | | Hand | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Amberjack | | | | | | | 19,500 | $297 |
| Angelfish | 400 | $14 | | | 2,900 | $101 | 1,700 | 45 |
| Bluefish | 2,825,900 | 142,500 | | | 25,700 | 1,330 | 113,300 | 5,842 |
| Blue runner or hardtail | 51,300 | 1,067 | | | 52,400 | 673 | 4,600 | 111 |
| Cabio or crab eater | 300 | 7 | | | | | 1,500 | 45 |
| Catfish and bullheads | 1,000 | 35 | | | | | | |
| Crevalle | 93,700 | 1,719 | | | 10,300 | 354 | 4,900 | 124 |
| Croaker | 7,900 | 130 | | | | | 2,000 | 60 |
| Drum: | | | | | | | | |
| Black | 28,800 | 695 | | | 100 | 3 | 5,300 | 118 |
| Red or redfish | 392,300 | 13,619 | | | 261,300 | 9,691 | 202,800 | 6,976 |
| Flounders | 30,700 | 1,158 | | | 18,200 | 734 | | |
| Groupers | 12,800 | 562 | | | | | 5,129,400 | 160,322 |
| Grunts | | | | | | | 32,700 | 673 |
| Hogfish | | | | | | | 4,000 | 94 |
| Jewfish | 1,400 | 40 | | | | | 50,000 | 1,914 |

### *Fisheries of Florida, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Gill nets—Continued | | | | Trammel nets | | Lines | |
|---|---|---|---|---|---|---|---|---|
| | Runaround | | Stake | | | | Hand | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Kingfish or "king mackerel" | 57,900 | $1,737 | | | | | | |
| King whiting or "kingfish" | 29,000 | 576 | | | 2,100 | $63 | | |
| Mojarra | 239,400 | 4,344 | | | 1,200 | 25 | 500 | $15 |
| Moonfish | 4,100 | 120 | | | | | 1,300 | 39 |
| Mullet | 18,585,000 | 632,911 | | | 2,334,600 | 78,366 | | |
| Muttonfish | 30,000 | 1,942 | | | | | 194,100 | 11,776 |
| Permit | 7,200 | 149 | | | 1,000 | 25 | | |
| Pigfish | 8,200 | 161 | | | 2,200 | 72 | | |
| Pinfish or sailors choice | 30,500 | 444 | | | | | | |
| Pompano | 92,800 | 19,802 | | | 487,100 | 99,653 | 10,400 | 2,139 |
| Porgies | 6,800 | 241 | | | | | 38,900 | 1,161 |
| Sea bass | | | | | | | 40,900 | 1,873 |
| Sea catfish | | | | | 3,700 | 58 | | |
| Shad | | | 6,600 | $726 | | | | |
| Sheepshead | 372,200 | 9,583 | | | 108,600 | 3,677 | 158,600 | 3,752 |
| Snapper: | | | | | | | | |
| Mangrove | 39,200 | 1,166 | | | 2,500 | 86 | 116,700 | 4,494 |
| Red | | | | | | | 4,760,900 | 319,359 |
| Snook or sergeantfish | 60,100 | 2,470 | | | 18,600 | 734 | 348,900 | 13,813 |
| Spadefish | 9,000 | 180 | | | | | | |
| Spanish mackerel | 5,050,300 | 234,609 | | | 40,700 | 1,763 | 35,400 | 1,715 |
| Spot | 168,500 | 2,752 | | | 56,500 | 1,668 | 200 | 4 |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 1,458,100 | 93,532 | | | 393,000 | 26,071 | 1,010,600 | 65,035 |
| White | 28,200 | 1,299 | | | 800 | 27 | 22,100 | 897 |
| Sturgeon | | | 2,300 | 210 | | | | |
| Tenpounder | 9,600 | 208 | | | 4,300 | 108 | | |
| Tripletail | | | | | | | 1,000 | 22 |
| Yellowtail | | | | | | | 109,200 | 7,808 |
| Sea crawfish or spiny lobster | 4,400 | 220 | | | | | | |
| Total | 29,737,000 | 1,169,992 | 8,900 | 936 | 3,827,800 | 225,282 | 12,421,400 | 610,523 |

| Species | Lines—Continued | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Trawl | | Troll | | Trot with baits or snoods | | Trot with hooks | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Amberjack | | | 29,100 | $776 | | | | |
| Bluefish | | | 30,100 | 1,665 | | | | |
| Catfish and bullheads | | | | | | | 1,401,300 | $57,223 |
| Dolphin | | | 3,000 | 150 | | | | |
| Groupers | | | 1,800 | 54 | | | | |
| Kingfish or "king mackerel" | | | 3,254,900 | 121,338 | | | | |
| Sea catfish | | | | | | | 54,800 | 1,096 |
| Sharks | 1,640,000 | $9,224 | | | | | | |
| Spanish mackerel | | | 196,500 | 9,920 | | | | |
| Squeteagues or "sea trout," spotted | | | 4,100 | 267 | | | | |
| Crabs: | | | | | | | | |
| Hard | | | | | 2,939,900 | $46,531 | | |
| Soft and peelers | | | | | 1,500 | 89 | | |
| Turtles, soft-shell | | | | | | | 107,900 | 2,158 |
| Total | 1,640,000 | 9,224 | 3,519,500 | 134,170 | 2,941,400 | 46,620 | 1,564,000 | 60,477 |

## *Fisheries of Florida, 1937*—Continued

### CATCH: BY GEAR—Continued

| Species | Pound nets | | Fyke nets | | Dip nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Common | | Drop | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 3,000 | $210 | | | | | | |
| Blue runner or hardtail | 2,000 | 70 | | | | | | |
| Catfish and bullheads | 187,400 | 7,498 | 15,000 | $600 | | | | |
| Crevalle | 600 | 21 | | | | | | |
| Flounders | 100 | 4 | | | | | | |
| Snapper, mangrove | 300 | 10 | | | | | | |
| Spanish mackerel | 5,500 | 385 | | | | | | |
| Squeteagues or "sea trout," spotted | 1,000 | 70 | | | | | | |
| Tenpounder | 2,000 | 50 | | | | | | |
| Crabs, hard | | | | | 56,300 | $1,088 | 4,500 | $178 |
| Sea crawfish or spiny lobster | | | | | 79,800 | 4,737 | | |
| Shrimp | | | | | 125,000 | 8,750 | | |
| Scallops, bay | | | | | 13,400 | 1,372 | | |
| Total | 201,900 | 8,318 | 15,000 | 600 | 274,500 | 15,947 | 4,500 | 178 |

| Species | Cast nets | | Otter trawls | | Pots | | Spears | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Angelfish | | | | | 4,000 | $80 | | |
| Blue runner or hardtail | | | | | 26,000 | 520 | | |
| Catfish and bullheads | | | | | 71,700 | 3,196 | | |
| Crappie | | | | | 174,000 | 5,497 | | |
| Crevalle | | | | | 13,500 | 270 | | |
| Croaker | | | 2,600 | $35 | | | | |
| Eels, common | | | | | 8,600 | 215 | | |
| Flounders | | | 162,800 | 12,088 | | | 48,200 | $2,398 |
| Groupers | | | | | 28,500 | 1,710 | | |
| Grunts | | | | | 18,500 | 370 | | |
| Hogfish | | | | | 7,200 | 154 | | |
| Jewfish | | | | | 2,500 | 75 | | |
| King whiting or "kingfish" | | | 638,900 | 9,690 | | | | |
| Mojarra | 13,300 | $316 | | | 7,000 | 175 | | |
| Mullet | 137,400 | 4,728 | | | | | | |
| Muttonfish | | | | | 9,100 | 728 | | |
| Porgies | | | 2,800 | 33 | | | | |
| Sea bass | | | 1,100 | 67 | | | | |
| Sheepshead | | | | | 14,200 | 284 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | 400 | 4 | | | | |
| White | | | 500 | 15 | | | | |
| Sunfish | | | | | 157,400 | 4,914 | | |
| Crabs: | | | | | | | | |
| Hard | | | 55,000 | 825 | 1,470,400 | 25,184 | | |
| Stone | | | | | 43,200 | 8,591 | | |
| Sea crawfish or spiny lobster | | | | | 190,300 | 15,224 | | |
| Shrimp | 153,500 | 4,774 | 13,758,900 | 418,288 | | | | |
| Total | 304,200 | 9,818 | 14,623,000 | 441,045 | 2,246,100 | 67,187 | 48,200 | 2,398 |

| Species | Dredges | | Tongs | | Rakes | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams, hard, public | 701,000 | $43,911 | | | | |
| Oysters, market: | | | | | | |
| Public, spring | 154,900 | 7,193 | 278,300 | $19,070 | | |
| Public, fall | | | 363,800 | 27,382 | 2,000 | $125 |
| Private, spring | | | 55,200 | 3,580 | | |
| Private, fall | | | 123,000 | 5,933 | | |
| Scallops, bay | 67,300 | 5,530 | | | | |
| Total | 923,200 | 56,634 | 820,300 | 55,965 | 2,000 | 125 |

## *Fisheries of Florida, 1937*—Continued

### CATCH: BY GEAR—Continued

| Species | Forks | | Grabs | | Coquina scoops | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Sea crawfish or spiny lobster | | | 18,000 | $1,440 | | |
| Clams: | | | | | | |
| Coquina | | | | | 3,700 | $450 |
| Hard, public | 4,700 | $702 | 8,800 | 1,350 | | |
| Total | 4,700 | 702 | 26,800 | 2,790 | 3,700 | 450 |

| Species | Hooks | | | | Diving outfits | | By hand | |
|---|---|---|---|---|---|---|---|---|
| | Sponge | | Conch | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs, stone | | | | | | | 2,900 | $725 |
| Clams, hard, public | | | | | | | 33,600 | 3,209 |
| Conchs | | | 7,400 | $553 | | | | |
| Oysters, market: | | | | | | | | |
| Public, spring | | | | | | | 117,700 | 5,343 |
| Public, fall | | | | | | | 14,800 | 872 |
| Private, spring | | | | | | | 149,900 | 6,177 |
| Private, fall | | | | | | | 20,300 | 1,060 |
| Scallops, bay | | | | | | | 37,900 | 2,597 |
| Sponges: | | | | | | | | |
| Grass | 21,700 | $14,003 | | | | | | |
| Sheepswool | 91,300 | 222,881 | | | 352,700 | $866,486 | | |
| Wire | | | | | 16,200 | 12,382 | | |
| Yellow | 46,700 | 28,147 | | | 102,800 | 75,806 | | |
| Total | 159,700 | 265,031 | 7,400 | 553 | 471,700 | 954,674 | 377,100 | 19,983 |

### OPERATING UNITS: BY COUNTIES

| Item | Bay | Brevard | Broward | Charlotte | Citrus | Clay | Collier | Dade |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 109 | 2 | | | | | 3 | 2 |
| On boats and shore: | | | | | | | | |
| Regular | 221 | 147 | 20 | 170 | 152 | 35 | 297 | 220 |
| Casual | 44 | 26 | 26 | 27 | 31 | 4 | 109 | 39 |
| Total | 374 | 175 | 46 | 197 | 183 | 39 | 409 | 261 |
| Vessels, motor: | | | | | | | | |
| 5 to 10 tons | 5 | | | | | | 1 | 1 |
| 11 to 20 tons | 7 | 1 | | | | | | |
| 21 to 30 tons | 3 | | | | | | | |
| 61 to 70 tons | 1 | | | | | | | |
| Total | 16 | 1 | | | | | 1 | 1 |
| Net tonnage | 253 | 15 | | | | | 10 | 6 |
| Boats: | | | | | | | | |
| Motor | 46 | 86 | 19 | 58 | 74 | 13 | 165 | 143 |
| Other | 43 | 90 | 5 | 104 | 166 | 24 | 189 | 57 |
| Accessory boats | | | | | | | | 1 |
| Apparatus: | | | | | | | | |
| Haul seines | 17 | | 1 | 12 | | 7 | 6 | 1 |
| Length, yards | 5,800 | | 400 | 14,220 | | 12,150 | 2,450 | 400 |
| Gill nets: | | | | | | | | |
| Anchor | | 1 | | | | | | |
| Square yards | | 980 | | | | | | |
| Runaround | 21 | 96 | 6 | 82 | 144 | | 205 | 60 |
| Square yards | 14,400 | 72,300 | 8,600 | 106,300 | 78,410 | | 235,600 | 126,000 |
| Trammel nets | 1 | | | 10 | 30 | | 44 | 16 |
| Square yards | 750 | | | 25,300 | 18,800 | | 96,000 | 64,600 |
| Lines: | | | | | | | | |
| Hand | 182 | 6 | 24 | 35 | 42 | | 148 | 59 |
| Hooks | 364 | 6 | 24 | 35 | 42 | | 148 | 59 |
| Trawl | | 2 | | | | | | |
| Hooks | | 100 | | | | | | |
| Troll | | | 8 | 8 | 8 | | 56 | 78 |
| Hooks | | | 8 | 8 | 8 | | 56 | 78 |

## *Fisheries of Florida, 1937*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Bay | Brevard | Broward | Charlotte | Citrus | Clay | Collier | Dade |
|---|---|---|---|---|---|---|---|---|
| Apparatus—Continued | | | | | | | | |
| Lines—Continued | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Trot, with baits and snoods | | 44 | | | | | | |
| Baits and snoods | | 41,400 | | | | | | |
| Trot, with hooks | | | | | | 10 | | |
| Hooks | | | | | | 5,900 | | |
| Dip nets, common | 16 | 3 | | | | | | 12 |
| Cast nets | | | 2 | 34 | | | 10 | |
| Pots: | | | | | | | | |
| Crab | | 2,910 | | | | 240 | | 170 |
| Fish | | | | | | | | 320 |
| Sea crawfish | | | 260 | | | | | 1,815 |
| Spears | 12 | | | | | | | |
| Dredges: | | | | | | | | |
| Clam | | | | | | | 1 | |
| Scallop | 15 | | | | | | | |
| Yards at mouth | 12 | | | | | | | |
| Tongs, oyster | 40 | | | | 13 | | | |
| Grabs | | | | | | | | 9 |
| Hooks, sponge | | | | | 2 | | | |

| Item | Dixie | Duval | Escambia | Franklin | Glades | Gulf | Hendry | Hernando |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | 164 | 241 | 50 | | 56 | | |
| On boats and shore: | | | | | | | | |
| Regular | 51 | 262 | 83 | 356 | 30 | 46 | 10 | 8 |
| Casual | 17 | 90 | 17 | 24 | | 6 | | |
| Total | 68 | 516 | 341 | 430 | 30 | 108 | 10 | 8 |
| Vessels, motor: | | | | | | | | |
| 5 to 10 tons | | 16 | 2 | 13 | | | | |
| 11 to 20 tons | | 2 | | | | | | |
| 31 to 40 tons | | 2 | | | | 1 | | |
| 41 to 50 tons | | 3 | 6 | | | | | |
| 51 to 60 tons | | 1 | 3 | | | | | |
| 61 to 70 tons | | | 9 | | | 1 | | |
| 71 to 80 tons | | | 4 | | | | | |
| 81 to 90 tons | | | 1 | | | | | |
| 91 to 100 tons | | | 1 | | | | | |
| Total | | 24 | 26 | 13 | | 2 | | |
| Net tonnage | | 397 | 1,526 | 84 | | 93 | | |
| Boats: | | | | | | | | |
| Motor | 21 | 122 | 49 | 120 | 18 | 7 | 5 | 2 |
| Other | 73 | 158 | 30 | 97 | 24 | 18 | 8 | 8 |
| Accessory boats | | 18 | | | | 6 | | |
| Apparatus: | | | | | | | | |
| Purse seines, menhaden | | 6 | | | | 2 | | |
| Length, yards | | 1,650 | | | | 520 | | |
| Haul seines | | 10 | 1 | 13 | 8 | 4 | 2 | |
| Length, yards | | 6,950 | 400 | 6,300 | 7,200 | 1,700 | 1,800 | |
| Gill nets: | | | | | | | | |
| Anchor | 15 | 5 | | | | | | |
| Square yards | 4,500 | 10,500 | | | | | | |
| Drift | 15 | 37 | | 13 | | | | |
| Square yards | 9,000 | 95,300 | | 10,700 | | | | |
| Runaround | 54 | 24 | 14 | 55 | | 9 | | 8 |
| Square yards | 24,100 | 16,450 | 31,000 | 36,900 | | 5,600 | | 5,300 |
| Trammel nets | 35 | | 25 | | | | | |
| Square yards | 15,900 | | 28,000 | | | | | |
| Lines: | | | | | | | | |
| Hand | 39 | 56 | 256 | 61 | | | | |
| Hooks | 39 | 60 | 502 | 99 | | | | |
| Troll | | 15 | | 2 | | | | |
| Hooks | | 15 | | 2 | | | | |
| Trot with baits and snoods | | 47 | | 23 | | | | |
| Baits and snoods | | 16,500 | | 7,300 | | | | |
| Trot with hooks | | 84 | | 26 | 1 | | 2 | |
| Hooks | | 26,300 | | 2,800 | 200 | | 1,000 | |

### *Fisheries of Florida, 1937*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Dixie | Duval | Escambia | Franklin | Glades | Gulf | Hendry | Hernando |
|---|---|---|---|---|---|---|---|---|
| Apparatus—Continued. | | | | | | | | |
| Dip nets: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Common | | | | | | 6 | | |
| Drop | | | 20 | | | | | |
| Cast nets | | 25 | | | | | | |
| Otter trawls, shrimp | | 29 | 25 | 73 | | | | |
| Yards at mouth | | 608 | 245 | 808 | | | | |
| Pots: | | | | | | | | |
| Crab | | 640 | | | | | | |
| Fish | | | | 150 | 2,000 | | 500 | |
| Spears | | | | 19 | | 4 | | |
| Dredges, oyster | | | | 3 | | | | |
| Yards at mouth | | | | 3 | | | | |
| Tongs, oyster | 1 | 8 | 8 | 142 | | 18 | | |

| Item | Hillsborough | Indian River | Lee | Levy | Manatee | Martin | Monroe | Nassau |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 67 | | | | | | | 324 |
| On boats and shore: | | | | | | | | |
| Regular | 107 | 68 | 289 | 133 | 97 | 142 | 250 | 123 |
| Casual | 14 | 4 | 68 | 29 | 43 | 5 | 47 | 42 |
| Total | 188 | 72 | 357 | 162 | 140 | 147 | 297 | 489 |
| Vessels, motor: | | | | | | | | |
| 5 to 10 tons | 4 | | | | | | | 37 |
| 11 to 20 tons | 5 | | | | | | | 2 |
| 31 to 40 tons | | | | | | | | 8 |
| 41 to 50 tons | | | | | | | | 1 |
| 51 to 60 tons | | | | | | | | 1 |
| 71 to 80 tons | | | | | | | | 1 |
| 81 to 90 tons | | | | | | | | 1 |
| Total | 9 | | | | | | | 51 |
| Net tonnage | 95 | | | | | | | 822 |
| Boats: | | | | | | | | |
| Motor | 35 | 38 | 154 | 80 | 34 | 61 | 64 | 44 |
| Other | 96 | 42 | 231 | 130 | 83 | 59 | 170 | 80 |
| Accessory boats | | | | | | | | 36 |
| Apparatus: | | | | | | | | |
| Purse seines, menhaden | | | | | | | | 12 |
| Length, yards | | | | | | | | 3,500 |
| Haul seines | 2 | | 8 | 3 | 19 | 11 | | 3 |
| Length, yards | 1,100 | | 2,600 | 600 | 6,600 | 10,750 | | 550 |
| Gill nets: | | | | | | | | |
| Anchor | | | | 3 | | | | 2 |
| Square yards | | | | 3,600 | | | | 2,800 |
| Drift | | | | | 7 | | | 12 |
| Square yards | | | | | 10,900 | | | 6,200 |
| Runaround | 89 | 47 | 237 | 106 | 70 | 48 | 39 | 4 |
| Square yards | 86,100 | 40,550 | 244,400 | 44,200 | 85,300 | 78,850 | 52,400 | 2,240 |
| Stake | | | | | | | | 6 |
| Square yards | | | | | | | | 6,000 |
| Trammel nets | 1 | | 30 | 117 | 7 | 10 | 3 | |
| Square yards | 2,000 | | 71,700 | 47,800 | 13,200 | 11,000 | 2,800 | |
| Lines: | | | | | | | | |
| Hand | 104 | 14 | 67 | 47 | 24 | 32 | 87 | 7 |
| Hooks | 188 | 14 | 67 | 47 | 24 | 32 | 87 | 7 |
| Trawl | | | | | 5 | 8 | | |
| Hooks | | | | | 300 | 400 | | |
| Troll | 4 | | 27 | 117 | 8 | 22 | 48 | |
| Hooks | 4 | | 27 | 117 | 8 | 22 | 48 | |
| Trot with baits and snoods | 4 | 1 | 17 | | 24 | | | 32 |
| Baits and snoods | 800 | 500 | 6,800 | | 8,400 | | | 6,400 |
| Pound nets | | | | 1 | | | | |
| Dip nets, common | 3 | | | | 4 | | 20 | |
| Cast nets | 31 | | 66 | | | | | |
| Otter trawls, shrimp | | | | | | | | 72 |
| Yards at mouth | | | | | | | | 1,614 |
| Pots, crab | | 150 | | | 80 | | | |
| Dredges, scallop | | | 14 | | | | | |
| Yards at mouth | | | 7 | | | | | |
| Tongs, oyster | | 2 | | 3 | | | | |
| Forks | | | 2 | | 7 | | | |
| Coquina scoops | | | 2 | | | | | |
| Hooks: | | | | | | | | |
| Sponge | | | | | | | 132 | |
| Conch | | | | | | | 3 | |

## *Fisheries of Florida, 1937*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Okaloosa | Okeechobee | Palm Beach | Pasco | Pinellas | Putman | St. Johns | St. Lucie |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 14 | | | 5 | 65 | | 261 | |
| On boats and shore: | | | | | | | | |
| Regular | 178 | 67 | 289 | 111 | 977 | 142 | 63 | 157 |
| Casual | 5 | | 138 | | 188 | 3 | 9 | 3 |
| Total | 197 | 67 | 427 | 116 | 1,230 | 145 | 333 | 160 |
| Vessels, motor: | | | | | | | | |
| 5 to 10 tons | 1 | | | | 4 | | 86 | |
| 11 to 20 tons | | | | 1 | 5 | | 15 | |
| 21 to 30 tons | 1 | | | | | | 1 | |
| Total | 2 | | | 1 | 9 | | 102 | |
| Net tonnage | 28 | | | 19 | 103 | | 836 | |
| Boats: | | | | | | | | |
| Motor | 36 | 25 | 157 | 20 | 201 | 79 | 19 | 79 |
| Other | 26 | 54 | 99 | 92 | 282 | 111 | 36 | 21 |
| Apparatus: | | | | | | | | |
| Haul seines | 14 | 8 | 4 | | 21 | 45 | 10 | |
| Length, yards | 5,300 | 7,100 | 1,950 | | 9,200 | 29,600 | 740 | |
| Gill nets: | | | | | | | | |
| Drift | | | | | 4 | 5 | | |
| Square yards | | | | | 3,700 | 3,600 | | |
| Runaround | 4 | | 77 | 73 | 193 | | | 86 |
| Square yards | 2,400 | | 184,800 | 44,100 | 202,926 | | | 158,300 |
| Stake | 2 | | | | | | | |
| Square yards | 1,600 | | | | | | | |
| Trammel nets | 28 | | | | 5 | | | |
| Square yards | 32,200 | | | | 4,450 | | | |
| Lines: | | | | | | | | |
| Hand | 49 | | 152 | | 170 | | 25 | 55 |
| Hooks | 93 | | 152 | | 193 | | 37 | 55 |
| Troll | | | 222 | | 154 | | 2 | 134 |
| Hooks | | | 222 | | 154 | | 2 | 134 |
| Trot with baits and snoods | | | | | | | 6 | |
| Baits and snoods | | | | | | | 2,400 | |
| Trot with hooks | | 40 | 3 | | | 44 | | |
| Hooks | | 19,250 | 1,000 | | | 18,450 | | |
| Pound nets | | | | | | 20 | | |
| Fyke nets | | | | | | 8 | | |
| Cast nets | | | 21 | | | | 6 | |
| Otter trawls: | | | | | | | | |
| Fish | | | | | | | 5 | |
| Yards at mouth | | | | | | | 122 | |
| Shrimp | | | | | | | 113 | |
| Yards at mouth | | | | | | | 2,753 | |
| Pots: | | | | | | | | |
| Crab | | | | | 293 | | | |
| Eel | | | | | | 90 | | |
| Fish | | 1,550 | 400 | | | | | |
| Dredges, scallop | | | | | 8 | | | |
| Yards at mouth | | | | | 8 | | | |
| Tongs, oyster | 3 | | | | 10 | | 1 | 3 |
| Grabs | | | | | 2 | | | |
| Hooks, sponge | | | | 19 | 76 | | | |
| Diving outfits | | | | 1 | 71 | | | |

## *Fisheries of Florida, 1937*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Santa Rosa | Sara-sota | Semi-nole | Taylor | Volusia | Wa-kulla | Wal-ton |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels |  |  |  |  | 6 |  |  |
| On boats and shore: |  |  |  |  |  |  |  |
| Regular | 16 | 130 | 21 | 125 | 116 | 138 | 6 |
| Casual | 5 | 77 | 24 | 30 | 28 | 134 | 16 |
| Total | 21 | 207 | 45 | 155 | 150 | 272 | 22 |
| Vessels, motor, 5 to 10 tons |  |  |  |  | 3 |  |  |
| Net tonnage |  |  |  |  | 20 |  |  |
| Boats: |  |  |  |  |  |  |  |
| Motor | 9 | 75 | 17 | 46 | 50 | 56 | 4 |
| Other | 14 | 109 | 19 | 140 | 106 | 108 | 11 |
| Apparatus: |  |  |  |  |  |  |  |
| Haul seines |  | 11 | 6 |  | 16 | 14 |  |
| Length, yards |  | 5,800 | 2,000 |  | 8,885 | 4,200 |  |
| Gill nets, runaround |  | 103 |  | 79 | 26 | 102 |  |
| Square yards |  | 138,900 |  | 34,400 | 22,850 | 49,400 |  |
| Trammel nets | 14 | 17 |  | 59 |  | 108 | 6 |
| Square yards | 4,500 | 39,700 |  | 25,700 |  | 50,000 | 3,000 |
| Lines: |  |  |  |  |  |  |  |
| Hand |  | 33 |  | 49 | 28 | 38 |  |
| Hooks |  | 33 |  | 49 | 28 | 38 |  |
| Troll |  | 47 |  | 8 |  | 25 |  |
| Hooks |  | 47 |  | 8 |  | 25 |  |
| Trot with baits and snoods |  |  |  |  | 14 |  |  |
| Baits and snoods |  |  |  |  | 5,400 |  |  |
| Trot with hooks |  |  | 27 |  |  |  |  |
| Hooks |  |  | 6,950 |  |  |  |  |
| Dip nets: |  |  |  |  |  |  |  |
| Common |  |  |  |  | 15 | 4 |  |
| Drop |  |  |  |  |  | 6 |  |
| Cast nets |  | 25 |  |  | 12 |  |  |
| Otter trawls, shrimp |  |  |  |  | 6 |  |  |
| Yards at mouth |  |  |  |  | 135 |  |  |
| Pots, crab |  |  |  |  |  | 1,300 |  |
| Spears | 6 |  |  |  | 18 | 17 | 8 |
| Tongs, oyster | 9 | 5 |  |  | 31 | 7 | 11 |
| Rakes, oyster |  |  |  |  | 1 |  |  |
| Hooks, sponge |  |  |  | 27 |  |  |  |

### CATCH: BY COUNTIES

| Species | Bay |  | Brevard |  | Broward |  | Charlotte |  |
|---|---|---|---|---|---|---|---|---|
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 437,900 | $13,139 | 6,000 | $302 | 7,500 | $487 | 9,200 | $460 |
| Blue runner or hardtail | 371,800 | 3,718 |  |  |  |  | 1,500 | 23 |
| Cigarfish | 3,000 | 65 |  |  |  |  |  |  |
| Crevalle |  |  | 4,500 | 67 |  |  |  |  |
| Croaker | 700 | 21 |  |  |  |  |  |  |
| Drum: |  |  |  |  |  |  |  |  |
| Black | 700 | 21 | 7,900 | 188 |  |  | 500 | 12 |
| Red or redfish | 3,900 | 117 | 10,300 | 340 |  |  | 103,900 | 3,637 |
| Flounders | 4,600 | 231 |  |  |  |  | 1,600 | 64 |
| Groupers | 1,476,200 | 47,090 |  |  | 8,400 | 420 | 2,200 | 66 |
| Jewfish |  |  |  |  |  |  | 1,000 | 22 |
| Kingfish or "king mackerel" | 26,000 | 520 |  |  | 45,100 | 2,255 | 4,500 | 180 |
| King whiting or "kingfish" | 600 | 18 | 8,200 | 123 |  |  | 1,800 | 42 |
| Menhaden | 2,000 | 30 |  |  |  |  |  |  |
| Mojarra |  |  |  |  |  |  | 48,000 | 1,033 |
| Mullet | 1,507,600 | 45,553 | 798,900 | 23,967 | 17,000 | 510 | 1,920,500 | 60,500 |
| Muttonfish |  |  |  |  | 7,400 | 666 |  |  |
| Permit |  |  |  |  |  |  | 1,000 | 20 |
| Pigfish |  |  |  |  |  |  | 1,500 | 34 |
| Pinfish or sailors choice |  |  | 23,000 | 332 |  |  |  |  |
| Pompano | 14,200 | 2,580 | 17,900 | 4,117 | 4,200 | 966 | 43,800 | 8,760 |
| Porgies | 10,000 | 300 |  |  |  |  |  |  |
| Sharks |  |  | 520,000 | 3,113 |  |  |  |  |
| Sheepshead | 1,600 | 48 | 15,600 | 234 |  |  | 79,000 | 1,866 |
| Snapper: |  |  |  |  |  |  |  |  |
| Mangrove |  |  |  |  |  |  | 22,000 | 709 |
| Red | 798,800 | 55,136 |  |  |  |  |  |  |

## *Fisheries of Florida, 1937*—Continued

### CATCH: BY COUNTIES—Continued

| Species | Bay | | Brevard | | Broward | | Charlotte | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Snook or sergeantfish | | | 5, 600 | $223 | | | 35, 400 | $1, 416 |
| Spadefish | 600 | $18 | | | | | | |
| Spanish mackerel | 599, 600 | 20, 039 | | | 9, 800 | $490 | 176, 000 | 7, 445 |
| Spot | 1, 800 | 43 | 23, 600 | 353 | | | 2, 600 | 62 |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 80, 600 | 5, 198 | 226, 300 | 15, 870 | | | 251, 000 | 15, 650 |
| White | 2, 000 | 60 | | | | | 5, 000 | 250 |
| Tenpounder | 256, 000 | 5, 120 | | | | | | |
| Tripletail | | | | | | | 1, 000 | 22 |
| Crabs: | | | | | | | | |
| Hard | 1, 400 | 45 | 1, 247, 400 | 22, 453 | | | | |
| Stone | | | | | | | 500 | 120 |
| Sea crawfish or spiny lobster | | | | | 35, 000 | 2, 800 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 34, 000 | 2, 540 | | | | | | |
| Public, fall | 31, 400 | 2, 958 | | | | | | |
| Scallops, bay | 34, 000 | 2, 950 | | | | | | |
| Total | 5, 701, 000 | 207, 558 | 2, 915, 200 | 71, 682 | 134, 400 | 8, 594 | 2, 713, 500 | 102, 393 |

| Species | Citrus | | Clay | | Collier | | Dade | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Angelfish | | | | | | | 4, 600 | $92 |
| Bluefish | 10, 600 | $633 | | | 22, 200 | $1, 066 | 75, 300 | 4, 518 |
| Blue runner or hardtail | | | | | 400 | 8 | 30, 200 | 604 |
| Catfish and bullheads | | | 253, 500 | $11, 408 | | | | |
| Crappie | | | 1, 300 | 52 | | | | |
| Crevalle | | | | | 14, 100 | 290 | 20, 500 | 410 |
| Dolphin | | | | | | | 3, 000 | 150 |
| Drum: | | | | | | | | |
| Black | | | | | 1, 500 | 36 | 800 | 24 |
| Red or redfish | 92, 600 | 3, 704 | | | 128, 200 | 4, 571 | 1, 000 | 30 |
| Flounders | 6, 000 | 240 | | | 2, 500 | 66 | | |
| Groupers | 3, 600 | 108 | | | 15, 500 | 420 | 167, 800 | 9, 978 |
| Grunts | | | | | | | 31, 000 | 620 |
| Hogfish | | | | | | | 7, 200 | 154 |
| Jewfish | | | | | 2, 900 | 67 | 13, 800 | 414 |
| Kingfish or "king mackerel" | 400 | 16 | | | 133, 700 | 5, 633 | 234, 100 | 11, 705 |
| King whiting or "kingfish" | | | | | 300 | 6 | | |
| Mojarra | | | | | 58, 000 | 1, 180 | 17, 500 | 437 |
| Mullet | 1, 167, 900 | 54, 282 | | | 3, 123, 000 | 100, 381 | 620, 800 | 18, 618 |
| Muttonfish | | | | | | | 114, 400 | 9, 102 |
| Permit | | | | | 8, 200 | 174 | | |
| Pigfish | 200 | 8 | | | | | | |
| Pompano | 800 | 160 | | | 185, 100 | 36, 920 | 65, 500 | 15, 065 |
| Shad | | | 1, 000 | 70 | | | | |
| Sheepshead | 22, 500 | 900 | | | 57, 500 | 1, 174 | 25, 700 | 514 |
| Snapper, mangrove | 5, 600 | 224 | | | 36, 000 | 1, 162 | 14, 000 | 750 |
| Snook or sergeantfish | | | | | 204, 400 | 8, 076 | 31, 000 | 1, 240 |
| Spadefish | | | | | 9, 000 | 180 | | |
| Spanish mackerel | 2, 500 | 150 | | | 1, 009, 600 | 48, 655 | 662, 400 | 33, 120 |
| Spot | | | | | 400 | 8 | | |
| Squeteagues or "sea-trout": | | | | | | | | |
| Spotted | 132, 000 | 7, 920 | | | 224, 600 | 14, 956 | 25, 900 | 1, 813 |
| White | | | | | 2, 500 | 74 | | |
| Sunfish | | | 26, 600 | 1, 064 | | | | |
| Yellowtail | | | | | | | 25, 900 | 2, 027 |
| Crabs: | | | | | | | | |
| Hard | | | 188, 900 | 2, 833 | | | | |
| Stone | | | | | | | 7, 700 | 2, 541 |
| Sea crawfish or spiny lobster | | | | | | | 185, 300 | 14, 824 |
| Clams, hard, public | | | | | 701, 000 | 43, 911 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 4, 300 | 241 | | | | | | |
| Public, fall | 4, 300 | 243 | | | | | | |
| Private, spring | 8, 100 | 457 | | | | | | |
| Private, fall | 10, 400 | 585 | | | | | | |
| Sponges: | | | | | | | | |
| Grass | 300 | 209 | | | | | | |
| Sheepswool | 800 | 2, 002 | | | | | | |
| Yellow | 500 | 356 | | | | | | |
| Total | 1, 473, 400 | 72, 438 | 471, 300 | 15, 427 | 5, 940, 600 | 269, 014 | 2, 385, 400 | 128, 750 |

## *Fisheries of Florida, 1937*—Continued

### CATCH: BY COUNTIES—Continued

| Species | Dixie | | Duval | | Escambia | | Franklin | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Angelfish | 200 | $6 | | | | | | |
| Bluefish | 1,600 | 96 | 11,400 | $688 | 26,800 | $804 | 14,200 | $548 |
| Blue runner or hardtail | 1,500 | 45 | | | 4,600 | 70 | 7,900 | 158 |
| Catfish and bullheads | | | 705,200 | 28,210 | | | 89,300 | 4,016 |
| Crappie | | | 22,000 | 1,320 | | | | |
| Crevalle | 2,600 | 78 | 8,600 | 129 | | | | |
| Croaker | | | 2,800 | 46 | | | | |
| Drum: | | | | | | | | |
| Black | | | 4,300 | 129 | | | | |
| Red or redfish | 25,000 | 750 | 2,900 | 148 | 3,700 | 111 | 19,900 | 701 |
| Flounders | 2,200 | 66 | 8,400 | 420 | 4,100 | 142 | 30,600 | 1,398 |
| Groupers | | | 1,800 | 69 | 1,555,000 | 43,314 | 546,300 | 16,887 |
| Grunts | | | | | | | 300 | 9 |
| Kingfish or "king mackerel" | | | | | | | 700 | 14 |
| King whiting or "kingfish" | | | 143,500 | 2,140 | 2,100 | 63 | 2,300 | 123 |
| Menhaden | | | 51,609,000 | 136,346 | | | 24,000 | 652 |
| Mullet | 203,000 | 7,602 | 244,300 | 9,216 | 208,200 | 7,547 | 1,592,200 | 55,632 |
| Pompano | 1,200 | 240 | 2,200 | 440 | 28,500 | 5,700 | 1,500 | 294 |
| Porgies | | | | | 5,000 | 150 | 700 | 21 |
| Sea bass | | | 21,900 | 1,303 | | | | |
| Sea catfish | | | | | 5,000 | 100 | 54,800 | 1,096 |
| Shad | | | 89,000 | 9,043 | | | | |
| Sheepshead | 25,500 | 765 | | | 2,100 | 63 | 3,500 | 89 |
| Snapper: | | | | | | | | |
| Mangrove | 300 | 9 | | | | | | |
| Red | | | 58,100 | 4,522 | 2,757,200 | 180,413 | 214,900 | 14,387 |
| Spanish mackerel | 4,900 | 294 | 10,600 | 636 | 428,200 | 12,847 | 84,100 | 3,342 |
| Spot | | | 14,600 | 235 | 1,200 | 18 | 24,300 | 612 |
| Squeteagues of "sea-trout": | | | | | | | | |
| Spotted | 50,000 | 3,000 | 43,400 | 3,140 | 31,900 | 2,233 | 87,000 | 5,330 |
| White | | | | | 500 | 15 | 800 | 24 |
| Sturgeon | 25,000 | 2,500 | | | | | 6,200 | 621 |
| Sunfish | | | 27,900 | 1,395 | | | | |
| Tenpounder | | | | | | | 24,500 | 490 |
| Crabs, hard | | | 1,841,000 | 29,001 | 4,000 | 160 | 431,200 | 4,313 |
| Shrimp | | | 2,017,600 | 60,803 | 134,000 | 5,360 | 1,356,700 | 44,222 |
| Oysters, market: | | | | | | | | |
| Public, spring | | | | | 14,000 | 1,404 | 346,300 | 18,687 |
| Public, fall | 700 | 62 | 2,800 | 173 | 5,900 | 768 | 252,100 | 16,745 |
| Private, spring | | | 6,800 | 321 | | | | |
| Private, fall | | | 43,400 | 1,790 | | | | |
| Total | 343,700 | 15,513 | 56,943,500 | 291,663 | 5,222,000 | 261,282 | 5,216,300 | 190,411 |

| Species | Glades | | Gulf | | Hendry | | Hernando | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | | | 19,000 | $570 | | | 400 | $20 |
| Blue runner or hardtail | | | 3,000 | 30 | | | | |
| Catfish and bullheads | 339,000 | $10,170 | | | 39,000 | $1,360 | | |
| Crappie | 189,700 | 5,690 | | | 32,000 | 960 | | |
| Drum: | | | | | | | | |
| Black | | | 100 | 3 | | | | |
| Red or redfish | | | 3,600 | 108 | | | 1,500 | 45 |
| Flounders | | | 1,700 | 87 | | | 100 | 3 |
| King whiting or "kingfish" | | | 200 | 6 | | | | |
| Menhaden | | | 6,192,000 | 14,706 | | | | |
| Mullet | | | 421,100 | 12,633 | | | 42,200 | 1,480 |
| Pompano | | | 3,100 | 558 | | | | |
| Sheepshead | | | 400 | 12 | | | 1,600 | 48 |
| Snapper, mangrove | | | | | | | 100 | 3 |
| Spanish mackerel | | | 81,400 | 2,442 | | | 200 | 8 |
| Squeteagues or "sea trout," spotted | | | 14,500 | 818 | | | 3,100 | 202 |
| Sunfish | 225,700 | 6,771 | | | 52,000 | 1,300 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | | | 10,600 | 1,090 | | | | |
| Public, fall | | | 28,800 | 2,600 | | | | |
| Scallops, bay | | | 2,400 | 120 | | | | |
| Turtles, soft-shell | 41,500 | 830 | | | 20,000 | 400 | | |
| Total | 795,900 | 23,461 | 6,781,900 | 35,783 | 143,000 | 4,020 | 49,200 | 1,809 |

## *Fisheries of Florida, 1937*—Continued

### CATCH: BY COUNTIES—Continued

| Species | Hillsborough | | Indian River | | Lee | | Levy | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Amberjack | | | | | 2,000 | $45 | | |
| Angelfish | | | | | | | 2,500 | $88 |
| Bluefish | 900 | $46 | 89,500 | $4,474 | 16,800 | 840 | 20,300 | 1,421 |
| Blue runner or hardtail | 400 | 4 | | | | | 7,000 | 244 |
| Catfish and bullheads | | | | | | | 1,000 | 35 |
| Crevalle | 3,600 | 36 | 7,200 | 98 | 1,000 | 24 | 14,800 | 519 |
| Drum: | | | | | | | | |
| Black | 1,100 | 22 | 13,500 | 325 | 6,200 | 155 | | |
| Red or redfish | 46,200 | 1,860 | 21,100 | 632 | 150,200 | 5,258 | 82,500 | 2,887 |
| Flounders | 2,900 | 145 | | | 4,300 | 172 | 3,900 | 137 |
| Groupers | 409,300 | 12,443 | 1,100 | 48 | 10,400 | 312 | 7,000 | 210 |
| Jewfish | | | | | 4,900 | 118 | 2,000 | 70 |
| Kingfish or "king mackerel" | 8,200 | 246 | | | 23,300 | 932 | 265,200 | 7,960 |
| King whiting or "kingfish" | | | 2,000 | 30 | 3,600 | 109 | | |
| Mojarra | 81,900 | 888 | 21,600 | 315 | 34,500 | 807 | | |
| Moonfish | | | | | 500 | 12 | | |
| Mullet | 850,800 | 34,056 | 592,000 | 14,900 | 3,044,000 | 102,836 | 891,300 | 31,210 |
| Pigfish | | | | | | | 3,000 | 90 |
| Pinfish or sailors choice | | | 7,500 | 112 | | | | |
| Pompano | 1,800 | 405 | 4,200 | 966 | 122,800 | 24,560 | 5,100 | 1,020 |
| Sheepshead | 12,900 | 516 | 17,800 | 273 | 165,000 | 3,962 | 79,400 | 2,779 |
| Snapper: | | | | | | | | |
| Mangrove | 200 | 9 | 10,100 | 202 | 36,500 | 1,242 | 3,800 | 133 |
| Red | 393,700 | 25,148 | | | | | | |
| Snook or sergeantfish | 7,800 | 274 | 24,500 | 1,169 | 85,400 | 3,353 | | |
| Spanish mackerel | 21,400 | 1,070 | 60,900 | 2,936 | 290,500 | 12,448 | 16,500 | 1,155 |
| Spot | 15,100 | 151 | 70,300 | 1,058 | 6,100 | 145 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 64,900 | 4,041 | 220,600 | 13,355 | 361,900 | 22,387 | 214,100 | 14,982 |
| White | 17,300 | 563 | | | 5,800 | 290 | | |
| Tenpounder | | | | | | | 9,500 | 238 |
| Crabs: | | | | | | | | |
| Hard | 26,400 | 528 | 111,200 | 2,000 | 148,100 | 3,351 | | |
| Soft and peelers | | | | | 1,500 | 89 | | |
| Clams: | | | | | | | | |
| Coquina | | | | | 3,700 | 450 | | |
| Hard, public | | | | | 900 | 132 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | | | 2,700 | 227 | | | 800 | 71 |
| Public, fall | | | | | | | 6,900 | 619 |
| Scallops, bay | | | | | 30,600 | 2,560 | | |
| Turtles, green | | | | | | | 10,000 | 400 |
| Total | 1,966,800 | 82,451 | 1,277,800 | 43,120 | 4,560,500 | 186,589 | 1,646,600 | 66,268 |

| Species | Manatee | | Martin | | Monroe | | Nassau | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Amberjack | | | | | 1,000 | $20 | | |
| Bluefish | 25,300 | $1,265 | 391,600 | $19,580 | 6,300 | 441 | 500 | $30 |
| Blue runner or hardtail | 500 | 5 | | | 1,200 | 18 | | |
| Cabio or crab eater | 300 | 7 | | | | | | |
| Crevalle | 1,300 | 13 | 68,900 | 1,033 | | | | |
| Croaker | 1,400 | 28 | 21,300 | 364 | | | | |
| Drum: | | | | | | | | |
| Black | | | 32,100 | 622 | 3,200 | 64 | 800 | 24 |
| Red or redfish | 67,800 | 2,339 | 23,600 | 472 | 3,400 | 102 | 1,200 | 60 |
| Flounders | 5,100 | 204 | 2,500 | 75 | | | 22,300 | 1,140 |
| Groupers | 26,400 | 802 | 17,200 | 773 | 91,300 | 3,510 | | |
| Grunts | 100 | 2 | | | 18,100 | 362 | | |
| Hogfish | | | | | 4,000 | 94 | | |
| Jewfish | | | 13,800 | 414 | 22,000 | 1,150 | | |
| Kingfish or "king mackerel" | 5,600 | 224 | 6,900 | 344 | 561,400 | 22,456 | | |
| King whiting or "kingfish" | 400 | 8 | | | | | 187,700 | 2,832 |
| Menhaden | | | 51,000 | 510 | | | 81,878,000 | 220,246 |
| Mojarra | 14,500 | 329 | 12,100 | 231 | | | | |
| Mullet | 1,525,500 | 53,715 | 747,100 | 19,128 | 510,100 | 15,301 | 3,600 | 108 |
| Muttonfish | | | 31,000 | 620 | 46,100 | 2,708 | | |
| Permit | 1,100 | 22 | | | | | | |
| Pigfish | 1,000 | 18 | 24,000 | 360 | | | | |
| Pompano | 19,400 | 4,165 | 37,600 | 8,648 | 4,700 | 940 | | |

## *Fisheries of Florida, 1937*—Continued

CATCH: BY COUNTIES—Continued

| Species | Manatee | | Martin | | Monroe | | Nassau | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Porgies | 500 | $10 | ---- | ---- | 8,700 | $262 | ---- | ---- |
| Sea catfish | ---- | ---- | 5,000 | $50 | ---- | ---- | ---- | ---- |
| Shad | ---- | ---- | ---- | ---- | ---- | ---- | 19,100 | $2,101 |
| Sharks | 875,000 | 3,500 | 565,000 | 4,531 | ---- | ---- | 350,000 | 2,454 |
| Sheepshead | 50,200 | 1,222 | 23,100 | 345 | 700 | 17 | 800 | 16 |
| Skates | 3,000 | 15 | ---- | ---- | ---- | ---- | ---- | ---- |
| Snapper, mangrove | 3,400 | 90 | 22,200 | 666 | 10,800 | 668 | ---- | ---- |
| Snook or sergeantfish | 25,700 | 983 | 51,000 | 2,050 | 6,000 | 240 | ---- | ---- |
| Spadefish | 1,200 | 24 | ---- | ---- | ---- | ---- | ---- | ---- |
| Spanish mackerel | 67,600 | 3,097 | 261,000 | 13,052 | 308,700 | 13,889 | ---- | ---- |
| Spot | 2,000 | 40 | 13,500 | 205 | ---- | ---- | 3,000 | 45 |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 182,600 | 11,844 | 33,900 | 2,034 | 52,000 | 3,380 | 13,200 | 1,188 |
| White | 33,100 | 1,655 | ---- | ---- | ---- | ---- | ---- | ---- |
| Tenpounder | 7,000 | 140 | ---- | ---- | ---- | ---- | ---- | ---- |
| Tripletail | ---- | ---- | 22,200 | 335 | ---- | ---- | ---- | ---- |
| Yellowtail | ---- | ---- | ---- | ---- | 83,300 | 5,781 | ---- | ---- |
| Crabs: | | | | | | | | |
| Hard | 162,000 | 3,240 | ---- | ---- | ---- | ---- | 206,000 | 3,090 |
| Stone | 600 | 150 | ---- | ---- | 2,000 | 500 | ---- | ---- |
| Sea crawfish or spiny lobster | ---- | ---- | ---- | ---- | 67,800 | 3,777 | ---- | ---- |
| Shrimp | ---- | ---- | ---- | ---- | ---- | ---- | 3,075,900 | 92,447 |
| Clams, hard, public | 3,800 | 570 | ---- | ---- | ---- | ---- | ---- | ---- |
| Conchs | ---- | ---- | ---- | ---- | 7,400 | 553 | ---- | ---- |
| Oysters, market: | | | | | | | | |
| Public, spring | ---- | ---- | ---- | ---- | ---- | ---- | 37,300 | 1,680 |
| Public, fall | ---- | ---- | ---- | ---- | ---- | ---- | 1,800 | 108 |
| Private, spring | ---- | ---- | ---- | ---- | ---- | ---- | 147,300 | 6,054 |
| Private, fall | ---- | ---- | ---- | ---- | ---- | ---- | 17,900 | 908 |
| Scallops, bay | 2,900 | 542 | ---- | ---- | ---- | ---- | ---- | ---- |
| Sponges: | | | | | | | | |
| Grass | ---- | ---- | ---- | ---- | 4,700 | 2,196 | ---- | ---- |
| Sheepswool | ---- | ---- | ---- | ---- | 40,000 | 94,431 | ---- | ---- |
| Yellow | ---- | ---- | ---- | ---- | 16,900 | 6,117 | ---- | ---- |
| Total | 3,116,300 | 90,268 | 2,480,600 | 76,442 | 1,881,800 | 178,977 | 85,966,400 | 334,531 |

| Species | Okaloosa | | Okeechobee | | Palm Beach | | Pasco | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Amberjack | ---- | ---- | ---- | ---- | 2,500 | $50 | ---- | ---- |
| Angelfish | ---- | ---- | ---- | ---- | 1,100 | 33 | ---- | ---- |
| Bluefish | 33,500 | $1,005 | ---- | ---- | 1,250,000 | 63,265 | 7,800 | $395 |
| Blue runner or hardtail | 297,800 | 2,978 | ---- | ---- | 22,400 | 568 | ---- | ---- |
| Catfish and bullheads | ---- | ---- | 497,300 | $21,100 | 154,500 | 6,942 | ---- | ---- |
| Cigarfish | 13,800 | 276 | ---- | ---- | ---- | ---- | ---- | ---- |
| Crappie | ---- | ---- | 95,500 | 3,343 | 57,100 | 1,713 | ---- | ---- |
| Crevalle | ---- | ---- | ---- | ---- | 10,000 | 200 | ---- | ---- |
| Croaker | ---- | ---- | ---- | ---- | 2,100 | 41 | ---- | ---- |
| Drum: | | | | | | | | |
| Black | 100 | 3 | ---- | ---- | ---- | ---- | ---- | ---- |
| Red or redfish | 7,000 | 211 | ---- | ---- | 4,100 | 132 | 19,200 | 576 |
| Flounders | 1,600 | 96 | ---- | ---- | ---- | ---- | 2,200 | 66 |
| Groupers | 432,900 | 12,987 | ---- | ---- | 50,500 | 2,129 | ---- | ---- |
| Grunts | ---- | ---- | ---- | ---- | 1,300 | 40 | ---- | ---- |
| Jewfish | ---- | ---- | ---- | ---- | 900 | 19 | ---- | ---- |
| Kingfish or "king mackerel" | 16,900 | 338 | ---- | ---- | 1,353,200 | 40,946 | ---- | ---- |
| King whiting or "kingfish" | ---- | ---- | ---- | ---- | 500 | 10 | ---- | ---- |
| Menhaden | 32,000 | 480 | ---- | ---- | ---- | ---- | ---- | ---- |
| Mojarra | ---- | ---- | ---- | ---- | 27,500 | 825 | ---- | ---- |
| Moonfish | ---- | ---- | ---- | ---- | 4,900 | 147 | ---- | ---- |
| Mullet | 1,101,000 | 32,720 | ---- | ---- | 26,900 | 806 | 636,000 | 22,260 |
| Muttonfish | ---- | ---- | ---- | ---- | 27,500 | 1,146 | ---- | ---- |
| Pompano | 13,800 | 2,650 | ---- | ---- | 21,200 | 4,328 | 500 | 100 |
| Porgies | 13,600 | 408 | ---- | ---- | ---- | ---- | 600 | 18 |
| Sea catfish | 5,400 | 78 | ---- | ---- | ---- | ---- | ---- | ---- |
| Sheepshead | 100 | 3 | ---- | ---- | 1,600 | 50 | 7,700 | 231 |
| Snapper: | | | | | | | | |
| Mangrove | ---- | ---- | ---- | ---- | 100 | 6 | 1,700 | 51 |
| Red | 325,000 | 22,752 | ---- | ---- | ---- | ---- | ---- | ---- |
| Snook or sergeantfish | ---- | ---- | ---- | ---- | 4,600 | 137 | ---- | ---- |
| Spanish mackerel | 167,100 | 5,013 | ---- | ---- | 482,700 | 21,970 | 12,400 | 496 |
| Spot | 700 | 11 | ---- | ---- | 800 | 16 | ---- | ---- |

## *Fisheries of Florida, 1937*—Continued

### CATCH: BY COUNTIES—Continued

| Species | Okaloosa | | Okeechobee | | Palm Beach | | Pasco | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Squeteagues or "sea trout," spotted | 17, 700 | $1, 182 | | | 4, 100 | $304 | 47, 600 | $3, 092 |
| Sturgeon | 2, 300 | 210 | | | | | | |
| Sunfish | | | 109, 600 | $3, 938 | 26, 500 | 537 | | |
| Tenpounder | 134, 800 | 1, 948 | | | | | | |
| Sea crawfish or spiny lobster | | | | | 4, 400 | 220 | | |
| Oysters, market, public, fall | 1, 500 | 165 | | | | | | |
| Turtles, soft-shell | | | 140, 900 | 2, 818 | 5, 700 | 114 | | |
| Sponges: | | | | | | | | |
| Grass | | | | | | | 2, 000 | 1, 363 |
| Sheepswool | | | | | | | 13, 200 | 32, 983 |
| Wire | | | | | | | 300 | 199 |
| Yellow | | | | | | | 5, 300 | 3, 906 |
| Total | 2, 618, 600 | 85, 514 | 843, 300 | 31, 199 | 3, 548, 700 | 146, 694 | 756, 500 | 65, 736 |

| Species | Pinellas | | Putnam | | St. Johns | | St. Lucie | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 400, 000 | $1, 999 | | | | |
| Amberjack | 33, 000 | $820 | | | | | | |
| Bluefish | 40, 500 | 2, 413 | | | 8, 000 | $400 | 1, 013, 800 | $50, 690 |
| Blue runner or hardtail | 300 | 9 | | | | | 5, 300 | 79 |
| Cabio or crab eater | 1, 500 | 45 | | | | | | |
| Catfish and bullheads | | | 1, 745, 900 | 69, 842 | | | | |
| Crappie | | | 91, 000 | 2, 862 | | | | |
| Crevalle | | | | | | | 32, 000 | 480 |
| Croaker | | | | | 4, 600 | 95 | | |
| Drum: | | | | | | | | |
| Black | 1, 500 | 30 | | | 4, 000 | 120 | | |
| Red or redfish | 26, 300 | 952 | 100 | 4 | 3, 900 | 156 | 4, 400 | 132 |
| Eels, common | | | 8, 600 | 215 | | | | |
| Flounders | 9, 300 | 371 | | | 119, 000 | 9, 898 | | |
| Groupers | 299, 100 | 9, 173 | | | | | 14, 700 | 588 |
| Grunts | | | | | 3, 000 | 60 | | |
| Hickory shad | | | 51, 000 | 1, 520 | | | | |
| Kingfish or "king mackerel" | 198, 500 | 7, 904 | | | 1, 700 | 85 | 342, 300 | 17, 115 |
| King whiting or "kingfish" | 300 | 14 | | | 359, 500 | 5, 444 | 7, 200 | 108 |
| Mojarra | | | | | | | 20, 400 | 306 |
| Mullet | 1, 792, 100 | 64, 501 | 1, 600 | 48 | 77, 400 | 1, 997 | 371, 000 | 9, 270 |
| Muttonfish | | | | | | | 6, 800 | 204 |
| Pigfish | 500 | 10 | | | | | 5, 200 | 78 |
| Pompano | 9, 000 | 1, 800 | | | 800 | 190 | 1, 400 | 340 |
| Porgies | 6, 400 | 231 | | | 2, 800 | 33 | | |
| Sea bass | | | | | 1, 100 | 67 | | |
| Shad | | | 171, 800 | 12, 012 | | | | |
| Sheepshead | 33, 800 | 1, 342 | | | 5, 100 | 102 | 29, 500 | 442 |
| Snapper: | | | | | | | | |
| Mangrove | 8, 400 | 337 | | | | | | |
| Red | 60, 900 | 4, 263 | | | 48, 000 | 3, 840 | 16, 300 | 978 |
| Snook or sergeantfish | 6, 300 | 234 | | | | | 16, 600 | 664 |
| Spanish mackerel | 517, 700 | 28, 728 | | | 2, 000 | 100 | 741, 100 | 37, 055 |
| Spot | 4, 200 | 84 | | | | | 10, 700 | 160 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | | | 400 | 4 | | |
| Spotted | 461, 300 | 28, 080 | | | 15, 800 | 1, 422 | 23, 700 | 1, 422 |
| White | 14, 900 | 732 | | | | | | |
| Sunfish | | | 303, 400 | 8, 245 | | | | |
| Tenpounder | 2, 500 | 50 | | | | | | |
| Crabs: | | | | | | | | |
| Hard | | | | | 26, 000 | 520 | | |
| Stone | 17, 700 | 3, 320 | | | | | | |
| Shrimp | | | | | 6, 975, 400 | 209, 477 | | |
| Clams, hard, public | 9, 600 | 1, 500 | | | 28, 100 | 2, 373 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 3, 700 | 365 | | | 80, 200 | 3, 645 | 4, 000 | 520 |
| Public, fall | 6, 800 | 727 | | | 15, 100 | 756 | | |
| Private, spring | 13, 100 | 1, 080 | | | | | | |
| Scallops, bay | 42, 000 | 2, 880 | | | | | | |
| Turtles, soft-shell | | | 2, 700 | 55 | | | | |
| Sponges: | | | | | | | | |
| Grass | 10, 800 | 7, 514 | | | | | | |
| Sheepswool | 378, 000 | 929, 982 | | | | | | |
| Wire | 15, 900 | 12, 183 | | | | | | |
| Yellow | 119, 900 | 88, 486 | | | | | | |
| Total | 4, 145, 800 | 1, 200, 160 | 2, 776, 100 | 96, 802 | 7, 781, 900 | 240, 784 | 2, 666, 400 | 120, 631 |

*Fisheries of Florida, 1937*—Continued

CATCH: BY COUNTIES—Continued

| Species | Santa Rosa | | Sarasota | | Seminole | | Taylor | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Amberjack | | | 12,100 | $183 | | | | |
| Angelfish | | | | | | | 600 | $21 |
| Bluefish | | | 6,500 | 310 | | | 3,600 | 226 |
| Blue runner or hardtail | | | 5,500 | 80 | | | 5,000 | 174 |
| Catfish and bullheads | | | | | 289,200 | $11,568 | | |
| Crappie | | | | | 3,200 | 112 | | |
| Crevalle | | | | | | | 4,800 | 169 |
| Drum: | | | | | | | | |
| Black | | | 1,500 | 34 | | | | |
| Red or redfish | 200 | $8 | 15,800 | 553 | | | 42,200 | 1,479 |
| Flounders | 1,400 | 56 | 5,400 | 216 | | | 8,500 | 297 |
| Groupers | | | 6,800 | 171 | | | 1,500 | 45 |
| Grunts | | | 400 | 10 | | | | |
| Jewfish | | | 4,000 | 96 | | | | |
| Kingfish or "king mackerel" | | | 116,000 | 4,700 | | | 2,000 | 60 |
| King whiting or "kingfish" | | | 2,700 | 61 | | | | |
| Mojarra | | | 13,000 | 303 | | | | |
| Mullet | 162,000 | 4,770 | 1,175,500 | 38,206 | | | 366,000 | 12,690 |
| Permit | | | 1,500 | 61 | | | | |
| Pigfish | | | | | | | 1,200 | 42 |
| Pompano | | | 17.700 | 3,540 | | | 2,100 | 420 |
| Porgies | | | 200 | 2 | | | | |
| Shad | | | | | 5,500 | 220 | | |
| Sheepshead | 400 | 12 | 66,200 | 1,514 | | | 45,500 | 1,593 |
| Snapper, mangrove | | | 17,800 | 577 | | | 1,700 | 57 |
| Snook or sergeantfish | | | 19,700 | 741 | | | | |
| Spanish mackerel | | | 117,500 | 4,998 | | | 6,800 | 445 |
| Spot | 600 | 12 | 800 | 17 | | | 1,500 | 52 |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 17,000 | 1,190 | 109,100 | 6,885 | | | 174,000 | 10,965 |
| White | 200 | 8 | 6,900 | 345 | | | | |
| Sunfish | | | | | 14,200 | 426 | | |
| Crabs, stone | | | 400 | 105 | | | | |
| Clams, hard, public | | | 4,700 | 686 | | | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 5,700 | 587 | 5,200 | 376 | | | | |
| Public, fall | 6,200 | 840 | 800 | 78 | | | | |
| Scallops, bay | | | 6,700 | 447 | | | | |
| Sponges: | | | | | | | | |
| Grass | | | | | | | 3,900 | 2,721 |
| Sheepswool | | | | | | | 12,000 | 29,969 |
| Yellow | | | | | | | 6,900 | 5,088 |
| Total | 193,700 | 7,483 | 1,740,400 | 65,295 | 312,100 | 12,326 | 689,800 | 66,513 |

| Species | Volusia | | Wakulla | | Walton | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 16,200 | $738 | 5,500 | $240 | | |
| Blue runner or hardtail | | | 3,000 | 60 | | |
| Catfish and bullheads | 383,100 | 9,502 | | | | |
| Crappie | 32,300 | 1,294 | | | | |
| Crevalle | 2,000 | 30 | | | | |
| Drum: | | | | | | |
| Black | 5,000 | 100 | | | | |
| Red or redfish | 9,500 | 315 | 104,500 | 4,066 | 200 | $7 |
| Flounders | 28,200 | 1,410 | 12,400 | 596 | 1,700 | 117 |
| Groupers | 28,000 | 1,120 | | | | |
| Kingfish or "king mackerel" | | | 10,000 | 300 | | |
| King whiting or "kingfish" | 28,500 | 427 | | | | |
| Mullet | 308,900 | 10,610 | 1,570,100 | 458,277 | 60,000 | 2,100 |
| Pinfish or sailors choice | 2,000 | 30 | | | | |
| Pompano | 10,100 | 2,309 | 1,300 | 238 | | |
| Sea bass | 19,000 | 570 | | | | |
| Shad | 2,000 | 160 | | | | |
| Sheepshead | 3,900 | 58 | 40,500 | 1,330 | 100 | 3 |
| Snapper, red | 88,000 | 7,920 | | | | |
| Spanish mackerel | | | 6,800 | 272 | | |
| Spot | 40,300 | 601 | 55,500 | 1,665 | | |
| Squeteagues or "sea trout": | | | | | | |
| Spotted | 52,400 | 3,723 | 98,200 | 6,599 | 1,400 | 98 |
| White | | | | | 100 | 4 |

## *Fisheries of Florida, 1937*—Continued

### CATCH: BY COUNTIES—Continued

| Species | Volusia | | Wakulla | | Walton | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Sunfish | 194, 800 | $4, 860 | | | | |
| Crabs: | | | | | | |
| Hard | 130, 200 | 2, 182 | 2, 300 | $90 | | |
| Stone | | | 17, 200 | 2, 580 | | |
| Shrimp | 477, 800 | 19, 503 | | | | |
| Oysters, market: | | | | | | |
| Public, spring | | | 2, 100 | 173 | | |
| Public, fall | 2, 000 | 125 | 8, 800 | 890 | 4, 700 | $522 |
| Private, spring | 29, 800 | 1, 845 | | | | |
| Private, fall | 71, 600 | 3, 710 | | | | |
| Turtles, soft-shell | 3, 000 | 30 | | | | |
| Total | 1, 968, 600 | 73, 172 | 1, 938, 200 | 77, 376 | 68, 200 | 2, 851 |

### CATCH: BY DISTRICTS

| Species | East coast | | West coast | | Lake Okeechobee | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 400, 000 | $1, 999 | | | | |
| Amberjack | 2, 500 | 50 | 48, 100 | $1, 068 | | |
| Angelfish | 5, 700 | 125 | 3, 300 | 115 | | |
| Blue fish | 2, 869, 800 | 145, 172 | 708, 900 | 25, 938 | | |
| Blue runner or hardtail | 57, 900 | 1, 251 | 711, 400 | 7, 624 | | |
| Cabio or crab eater | | | 1, 800 | 52 | | |
| Catfish and bullheads | 3, 376, 900 | 130, 530 | 90, 300 | 4, 051 | 1, 029, 800 | $39, 572 |
| Cigarfish | | | 16, 800 | 341 | | |
| Crappie | 149, 800 | 5, 640 | | | 374, 300 | 11, 706 |
| Crevalle | 153, 700 | 2, 447 | 42, 200 | 1, 129 | | |
| Croaker | 33, 800 | 546 | 2, 100 | 49 | | |
| Dolphin | 3, 000 | 150 | | | | |
| Drum: | | | | | | |
| Black | 68, 400 | 1, 532 | 16, 400 | 380 | | |
| Red or redfish | 82, 100 | 2, 421 | 947, 800 | 34, 042 | | |
| Eels, common | 8, 600 | 215 | | | | |
| Flounders | 180, 400 | 12, 943 | 112, 100 | 4, 770 | | |
| Groupers | 289, 500 | 15, 125 | 4, 883, 500 | 147, 538 | | |
| Grunts | 35, 300 | 720 | 18, 900 | 383 | | |
| Hickory shad | 51, 000 | 1, 520 | | | | |
| Hogfish | 7, 200 | 154 | 4, 000 | 94 | | |
| Jewfish | 28, 500 | 847 | 36, 800 | 1, 523 | | |
| Kingfish or "king mackerel" | 1, 983, 300 | 72, 450 | 1, 372, 400 | 51, 483 | | |
| King whiting or "kingfish" | 737, 100 | 11, 114 | 14, 300 | 450 | | |
| Menhaden | 133, 358, 000 | 357, 102 | 6, 250, 000 | 15, 868 | | |
| Mojarra | 99, 100 | 2, 114 | 249, 900 | 4, 540 | | |
| Moonfish | 4, 900 | 147 | 500 | 12 | | |
| Mullet | 3, 809, 500 | 109, 178 | 23, 870, 100 | 818, 252 | | |
| Muttonfish | 187, 100 | 11, 738 | 46, 100 | 2, 708 | | |
| Permit | | | 11, 800 | 277 | | |
| Pigfish | 29, 200 | 438 | 7, 400 | 202 | | |
| Pinfish or sailors choice | 32, 500 | 474 | | | | |
| Pompano | 165, 100 | 37, 369 | 476, 400 | 95, 050 | | |
| Porgies | 2, 800 | 33 | 45, 700 | 1, 402 | | |
| Sea bass | 42, 000 | 1, 940 | | | | |
| Sea catfish | 5, 000 | 50 | 65, 200 | 1, 274 | | |
| Shad | 288, 400 | 23, 606 | | | | |
| Sharks | 1, 435, 000 | 10, 098 | 875, 000 | 3, 500 | | |
| Sheepshead | 123, 100 | 2, 034 | 696, 200 | 19, 489 | | |
| Skates | | | 3, 000 | 15 | | |
| Snapper: | | | | | | |
| Mangrove | 46, 400 | 1, 624 | 148, 300 | 5, 271 | | |
| Red | 210, 400 | 17, 260 | 4, 550, 500 | 302, 099 | | |
| Snook or sergeantfish | 133, 300 | 5, 483 | 390, 700 | 15, 317 | | |
| Spadefish | | | 10, 800 | 222 | | |
| Spanish mackerel | 2, 230, 500 | 109, 359 | 3, 919, 500 | 166, 833 | | |
| Spot | 176, 800 | 2, 673 | 116, 800 | 2, 920 | | |
| Squeteagues or "sea trout": | | | | | | |
| Gray | 400 | 4 | | | | |
| Spotted | 659, 300 | 44, 271 | 2, 676, 500 | 170, 032 | | |
| White | | | 89, 100 | 4, 020 | | |
| Sturgeon | | | 33, 500 | 3, 331 | | |
| Sunfish | 566, 900 | 15, 990 | | | 413, 800 | 12, 546 |
| Tenpounder | | | 434, 300 | 7, 986 | | |
| Tripletail | 22, 200 | 335 | 1, 000 | 22 | | |
| Yellowtail | 25, 900 | 2, 027 | 83, 300 | 5, 781 | | |

## *Fisheries of Florida, 1937*—Continued

### CATCH: BY DISTRICTS—Continued

| Species | East coast | | West coast | | Lake Okeechobee | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs: | | | | | | |
| Hard | 3,750,700 | $62,079 | 775,400 | $11,727 | | |
| Soft and peelers | | | 1,500 | 89 | | |
| Stone | 7,700 | 2,541 | 38,400 | 6,775 | | |
| Sea crawfish or spiny lobster | 224,700 | 17,844 | 67,800 | 3,777 | | |
| Shrimp | 12,546,700 | 382,230 | 1,490,700 | 49,582 | | |
| Clams: | | | | | | |
| Coquina | | | 3,700 | 450 | | |
| Hard, public | 28,100 | 2,373 | 720,000 | 46,799 | | |
| Conchs | | | 7,400 | 553 | | |
| Oysters, market: | | | | | | |
| Public, spring | 124,200 | 6,072 | 426,700 | 25,534 | | |
| Public, fall | 21,700 | 1,162 | 358,900 | 27,217 | | |
| Private, spring | 183,900 | 8,220 | 21,200 | 1,537 | | |
| Private, fall | 132,900 | 6,408 | 10,400 | 585 | | |
| Scallops, bay | | | 118,600 | 9,499 | | |
| Turtles: | | | | | | |
| Green | | | 10,000 | 400 | | |
| Soft-shell | 5,700 | 85 | | | 208,100 | $4,162 |
| Sponges: | | | | | | |
| Grass | | | 21,700 | 14,003 | | |
| Sheepswool | | | 444,000 | 1,089,367 | | |
| Wire | | | 16,200 | 12,382 | | |
| Yellow | | | 149,500 | 103,953 | | |
| Total | 171,384,600 | 1,651,312 | 58,764,800 | 3,331,682 | 2,026,000 | 67,986 |

## *Sponge fishery of Florida, 1937*

### OPERATING UNITS: BY GEAR

| Item | Sponge hooks | Diving outfits | Total |
|---|---|---|---|
| | *Number* | *Number* | *Number* |
| Fishermen: | | | |
| On vessels | | 49 | 49 |
| On boats and shore, regular | 380 | 520 | 900 |
| Total | 380 | 569 | 949 |
| Vessels, motor | | 7 | 7 |
| Net tonnage | | 75 | 75 |
| Boats: | | | |
| Motor | | 65 | 65 |
| Other | 256 | | 256 |
| Apparatus, number | 256 | 72 | 328 |

### CATCH: BY GEAR

| Sponges | Sponge hooks | | Diving outfits | | Total | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Grass | 21,700 | $14,003 | | | 21,700 | $14,003 |
| Sheepswool | 91,300 | 222,881 | 352,700 | $866,486 | 444,000 | 1,089,367 |
| Wire | | | 16,200 | 12,382 | 16,200 | 12,382 |
| Yellow | 46,700 | 28,147 | 102,800 | 75,806 | 149,500 | 103,953 |
| Total | 159,700 | 265,031 | 471,700 | 954,674 | 631,400 | 1,219,705 |

### SPONGES SOLD AT THE EXCHANGE, TARPON SPRINGS, FLA.

During 1937 sponges sold on the exchange at Tarpon Springs, Fla., amounted to 561,943 pounds, valued at $1,097,301. This is a decrease of 11 percent in quantity but an increase of 6 percent in value as compared with the transactions on the exchange in 1936. Revised data on the volume of sponges sold on the exchange in 1936 show that sales during that year totaled 628,226 pounds, valued at $1,035,429. Of the total sponges sold on the exchange during 1937, 43,218 pounds, valued at $163,745, were large wool; 26,511 pounds, valued at $60,923, were medium and small wool; 329,018 pounds, valued at $752,032, were wool rags; 130,562 pounds, valued at $96,536, were yellow; 16,954 pounds, valued at $11,807, were grass; and 15,680 pounds, valued at $12,258, were wire. It is estimated that sponges valued at $1,250 were sold outside the exchange.

## ALABAMA

*Fisheries of Alabama, 1937*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Gill nets, stake | Trammel nets | Lines |  |  | Fyke nets |
|---|---|---|---|---|---|---|---|
|  |  |  |  | Hand | Trot with baits or snoods | Trot with hooks |  |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels |  |  |  | 79 |  |  |  |
| On boats and shore: |  |  |  |  |  |  |  |
| Regular | 36 | 3 | 163 | 29 | 94 | 28 | 7 |
| Casual |  |  | 5 | 16 | 11 | 31 |  |
| Total | 36 | 3 | 168 | 124 | 105 | 59 | 7 |
| Vessels, motor: |  |  |  |  |  |  |  |
| 5 to 10 tons |  |  |  | 1 |  |  |  |
| 11 to 20 tons |  |  |  | 9 |  |  |  |
| 61 to 70 tons |  |  |  | 1 |  |  |  |
| Total |  |  |  | 11 |  |  |  |
| Net tonnage |  |  |  | 202 |  |  |  |
| Boats: |  |  |  |  |  |  |  |
| Motor | 5 | 2 | 57 | 10 | 32 | 9 | 7 |
| Other | 6 | 1 | 162 | 27 | 70 | 49 |  |
| Apparatus: |  |  |  |  |  |  |  |
| Number | 6 | 12 | 166 | 124 | 102 | 279 | 90 |
| Length, yards | 3,500 |  |  |  |  |  |  |
| Square yards |  | 2,525 | 82,400 |  |  |  |  |
| Hooks, baits, or snoods |  |  |  | 203 | 29,900 | 83,100 |  |

| Item | Otter trawls, shrimp | Pots, fish | Spears | Dredges, oyster | Tongs, oyster | By hand |  | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  | Oyster | Other |  |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 48 |  |  | 53 | 40 |  |  | 168 |
| On boats and shore: |  |  |  |  |  |  |  |  |
| Regular | 323 | 45 | 22 | 12 | 198 | 10 | 20 | 653 |
| Casual |  | 15 | 32 |  | 20 |  | 22 | 110 |
| Total | 371 | 60 | 54 | 65 | 258 | 10 | 42 | 931 |
| Vessels, motor: |  |  |  |  |  |  |  |  |
| 5 to 10 tons | 14 |  |  | 8 | 12 |  |  | 19 |
| 11 to 20 tons | 7 |  |  | 5 | 1 |  |  | 17 |
| 41 to 50 tons |  |  |  | 1 |  |  |  | 1 |
| 61 to 70 tons |  |  |  |  |  |  |  | 1 |
| Total | 21 |  |  | 14 | 13 |  |  | 38 |
| Net tonnage | 203 |  |  | 169 | 111 |  |  | 494 |
| Boats: |  |  |  |  |  |  |  |  |
| Motor | 156 | 8 |  | 6 | 74 |  |  | 264 |
| Other |  | 52 |  |  | 151 |  | 12 | 412 |
| Apparatus: |  |  |  |  |  |  |  |  |
| Number | 177 | 655 | 54 | 25 | 244 |  |  |  |
| Yards at mouth | 2,639 |  |  | 25 |  |  |  |  |

## *Fisheries of Alabama, 1937*—Continued

### CATCH: By gear

| Species | Haul seines | | Gill nets, stake | | Trammel nets | | Lines | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hand | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 17,700 | $1,103 | | | 10,600 | $619 | | |
| Blue runner or hardtail | 13,400 | 332 | | | 900 | 19 | | |
| Croaker | 5,600 | 126 | | | 25,400 | 575 | | |
| Drum: | | | | | | | | |
| Black | 3,100 | 109 | | | 4,600 | 161 | | |
| Red or redfish | 25,200 | 1,890 | | | 34,800 | 2,609 | 6,700 | $503 |
| Flounders | 3,000 | 285 | | | 17,900 | 1,713 | | |
| Groupers | | | | | | | 219,200 | 7,670 |
| King whiting or "kingfish" | 2,300 | 69 | | | 4,900 | 141 | | |
| Mullet | 877,200 | 25,408 | | | 2,856,200 | 82,612 | | |
| Pompano | 700 | 134 | | | 1,100 | 204 | | |
| Sea catfish | 3,900 | 92 | | | 21,700 | 498 | | |
| Sheepshead, salt-water | 19,100 | 955 | | | 22,000 | 1,100 | 300 | 15 |
| Snapper, red | | | | | | | 1,168,200 | 83,867 |
| Spanish mackerel | 9,800 | 832 | | | 13,200 | 1,158 | 300 | 26 |
| Spot | 6,900 | 157 | | | 28,600 | 642 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 25,400 | 2,414 | | | 107,300 | 10,220 | 12,800 | 1,216 |
| White | 5,000 | 162 | | | 14,900 | 482 | 2,600 | 82 |
| Sturgeon | | | 3,100 | $233 | | | | |
| Tenpounder | 6,400 | 128 | | | 14,000 | 280 | | |
| Total | 1,024,700 | 34,196 | 3,100 | 233 | 3,178,100 | 103,033 | 1,410,100 | 93,379 |

| Species | Lines—Continued | | | | Fyke nets | | Otter trawls | |
|---|---|---|---|---|---|---|---|---|
| | Trot with baits or snoods | | Trot with hooks | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Buffalofish | | | | | 29,000 | $1,650 | | |
| Catfish and bullheads | | | 33,900 | $2,543 | 7,300 | 547 | | |
| Paddlefish or spoonbill cat | | | 20,100 | 1,407 | 1,200 | 88 | | |
| Sheepshead, fresh-water | | | | | 13,500 | 675 | | |
| Crabs, hard | 756,000 | $11,336 | | | | | | |
| Shrimp | | | | | | | 3,103,800 | $137,985 |
| Total | 756,000 | 11,336 | 54,000 | 3,950 | 51,000 | 2,960 | 3,103,800 | 137,985 |

| Species | Pots | | Spears | | Dredges | | Tongs | | By hand | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Catfish and bullheads | 75,400 | $5,661 | | | | | | | | |
| Flounders | | | 16,400 | $1,562 | | | | | | |
| Oysters, market: | | | | | | | | | | |
| Public, spring | | | | | 643,600 | $27,681 | 282,500 | $13,902 | | |
| Public, fall | | | | | | | 197,400 | 15,572 | | |
| Private, spring | | | | | | | 48,800 | 3,077 | | |
| Private, fall | | | | | | | 62,900 | 5,913 | | |
| Terrapin, diamond-back | | | | | | | | | 9,300 | $930 |
| Total | 75,400 | 5,661 | 16,400 | 1,562 | 643,600 | 27,681 | 591,600 | 38,464 | 9,300 | 930 |

### OPERATING UNITS: By counties

| Item | Baldwin | Mobile |
|---|---|---|
| | *Number* | *Number* |
| Fishermen: | | |
| On vessels | 11 | 157 |
| On boats and shore: | | |
| Regular | 87 | 566 |
| Casual | 25 | 85 |
| Total | 123 | 808 |

*Fisheries of Alabama, 1937*—Continued

OPERATING UNITS: By counties—Continued

| Item | Baldwin | Mobile |
|---|---|---|
| Vessels, motor: | *Number* | *Number* |
| 5 to 10 tons | 2 | 17 |
| 11 to 20 tons | 1 | 16 |
| 41 to 50 tons | | 1 |
| 61 to 70 tons | | 1 |
| Total vessels | 3 | 35 |
| Total net tonnage | 32 | 462 |
| Boats: | | |
| Motor | 34 | 230 |
| Other | 72 | 340 |
| Apparatus: | | |
| Haul seines | 2 | 4 |
| Length, yards | 1,200 | 2,300 |
| Gill nets, stake | 12 | |
| Square yards | 2,525 | |
| Trammel nets | 38 | 128 |
| Square yards | 20,600 | 61,800 |
| Lines: | | |
| Hand | 26 | 98 |
| Hooks | 31 | 172 |
| Trot with baits or snoods | 6 | 96 |
| Baits or snoods | 1,600 | 28,300 |
| Trot with hooks | 82 | 197 |
| Hooks | 24,400 | 58,700 |
| Fyke nets | 15 | 75 |
| Otter trawls, shrimp | 11 | 166 |
| Yards at mouth | 158 | 2,481 |
| Pots, fish | 165 | 490 |
| Spears | 21 | 33 |
| Dredges, oyster | 2 | 23 |
| Yard at mouth | 2 | 23 |
| Tongs, oyster | 36 | 208 |

CATCH: By counties

| Species | Baldwin | | Mobile | |
|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 5,100 | $445 | 23,200 | $1,277 |
| Blue runner or hardtail | | | 14,300 | 351 |
| Buffalofish | 6,000 | 500 | 23,000 | 1,150 |
| Catfish and bullheads | 32,000 | 2,401 | 84,600 | 6,350 |
| Croaker | 10,900 | 249 | 20,100 | 452 |
| Drum: | | | | |
| Black | 600 | 21 | 7,100 | 249 |
| Red or redfish | 13,400 | 1,005 | 53,300 | 3,997 |
| Flounders | 8,800 | 853 | 28,500 | 2,707 |
| Groupers | 14,400 | 504 | 204,800 | 7,166 |
| King whiting or "kingfish" | 2,600 | 72 | 4,600 | 138 |
| Mullet | 856,200 | 24,569 | 2,877,200 | 83,451 |
| Paddlefish or spoonbill cat | 4,600 | 326 | 16,700 | 1,169 |
| Pompano | 800 | 158 | 1,000 | 180 |
| Sea catfish | 4,600 | 111 | 21,000 | 479 |
| Sheepshead: | | | | |
| Fresh-water | 3,300 | 165 | 10,200 | 510 |
| Salt-water | 4,700 | 235 | 36,700 | 1,835 |
| Snapper, red | 15,300 | 1,077 | 1,152,900 | 82,790 |
| Spanish mackerel | 7,800 | 631 | 15,500 | 1,385 |
| Spot | 11,100 | 249 | 24,400 | 550 |
| Squeteagues or "sea trout": | | | | |
| Spotted | 38,300 | 3,658 | 107,200 | 10,192 |
| White | 5,700 | 181 | 16,800 | 545 |
| Sturgeon | 3,100 | 233 | | |
| Tenpounder | 2,500 | 50 | 17,900 | 358 |
| Crabs, hard | 20,000 | 300 | 736,000 | 11,036 |
| Shrimp | 199,000 | 8,998 | 2,904,800 | 128,987 |
| Oysters, market: | | | | |
| Public, spring | 71,000 | 3,249 | 855,100 | 38,334 |
| Public, fall | 19,100 | 1,496 | 178,300 | 14,076 |
| Private, spring | 24,900 | 1,368 | 23,900 | 1,709 |
| Private, fall | 30,800 | 2,467 | 32,100 | 3,446 |
| Terrapin, diamond-back | 3,700 | 370 | 5,600 | 560 |
| Total | 1,420,300 | 55,941 | 9,496,800 | 405,429 |

## MISSISSIPPI

### *Fisheries of Mississippi, 1937*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Trammel nets | Lines | | | Cast nets |
|---|---|---|---|---|---|---|
| | | | Hand | Troll | Trot, with baits or snoods | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | 24 | | | |
| On boats and shore: | | | | | | |
| Regular | 52 | 74 | 61 | 6 | 172 | 15 |
| Casual | 4 | | 35 | | 11 | 26 |
| Total | 56 | 74 | 120 | 6 | 183 | 41 |
| Vessels, motor: | | | | | | |
| 5 to 10 tons | | | 3 | | | |
| 21 to 30 tons | | | 1 | | | |
| Total | | | 4 | | | |
| Net tonnage | | | 48 | | | |
| Boats: | | | | | | |
| Motor | 12 | 26 | 18 | 3 | 65 | |
| Other | 12 | 59 | 43 | | 106 | 5 |
| Apparatus: | | | | | | |
| Number | 12 | 59 | 120 | 6 | 173 | 41 |
| Length, yards | 4,800 | | | | | |
| Square yards | | 29,850 | | | | |
| Hooks, baits, or snoods | | | 149 | 6 | 101,600 | |

| Item | Otter trawls, shrimp | Spears | Dredges, oyster | Tongs, oyster | By hand, other than for oysters | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 424 | | 793 | | | 983 |
| On boats and shore: | | | | | | |
| Regular | 1,003 | 16 | 155 | 634 | 2 | 1,670 |
| Casual | 22 | 29 | | 20 | 2 | 116 |
| Total | 1,449 | 45 | 948 | 654 | 4 | 2,769 |
| Vessels: | | | | | | |
| Motor: | | | | | | |
| 5 to 10 tons | 105 | | 61 | | | 113 |
| 11 to 20 tons | 80 | | 77 | | | 103 |
| 21 to 30 tons | 6 | | 12 | | | 14 |
| 31 to 40 tons | 1 | | 1 | | | 2 |
| 41 to 50 tons | | | 1 | | | 1 |
| Total | 192 | | 152 | | | 233 |
| Net tonnage | 2,131 | | 1,989 | | | 2,831 |
| Sail: | | | | | | |
| 5 to 10 tons | | | 3 | | | 3 |
| 11 to 20 tons | | | 4 | | | 4 |
| Total | | | 7 | | | 7 |
| Net tonnage | | | 84 | | | 84 |
| Total vessels | 192 | | 159 | | | 240 |
| Total net tonnage | 2,131 | | 2,073 | | | 2,915 |
| Boats: | | | | | | |
| Motor | 503 | | 35 | 111 | | 605 |
| Other | | | | 522 | | 633 |
| Apparatus: | | | | | | |
| Number | 695 | 45 | 385 | 621 | | |
| Yards at mouth | 10,637 | | 388 | | | |

## *Fisheries of Mississippi, 1937*—Continued

### CATCH: BY GEAR

| Species | Haul seines | | Trammel nets | | Lines | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Hand | | Troll | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | | | 5, 200 | $160 | 2, 400 | $73 | | |
| Drum: | | | | | | | | |
| Black | | | 7, 600 | 250 | 3, 700 | 112 | | |
| Red or redfish | | | 104, 900 | 5, 245 | 18, 300 | 915 | | |
| Flounders | | | 5, 500 | 495 | | | | |
| Groupers | | | | | 128, 600 | 3, 857 | | |
| King whiting or "kingfish" | | | 7, 500 | 234 | 900 | 28 | | |
| Mullet | | | 153, 600 | 4, 610 | | | | |
| Pompano | | | 100 | 15 | | | | |
| Sea catfish | | | 8, 300 | 166 | 2, 500 | 50 | | |
| Sheepshead | | | 29, 300 | 1, 172 | 3, 800 | 152 | | |
| Snapper, red | | | | | 303, 800 | 21, 251 | | |
| Spanish mackerel | | | | | | | 700 | $84 |
| Spot | | | 1, 200 | 39 | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | | | 122, 100 | 10, 990 | 88, 500 | 7, 965 | | |
| White | | | 108, 900 | 3, 956 | 53, 400 | 2, 076 | | |
| Crabs, hard | | | | | 16, 700 | 292 | | |
| Shrimp, Mississippi | 180, 000 | $8, 100 | | | | | | |
| Total | 180, 000 | 8, 100 | 554, 200 | 27, 332 | 622, 600 | 36, 771 | 700 | 84 |

| Species | Lines—Continued | | Cast nets | | Otter trawls | | Spears | |
|---|---|---|---|---|---|---|---|---|
| | Trot with baits or snoods | | | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders | | | | | 1, 500 | $135 | 20, 800 | $1, 842 |
| Mullet | | | 7, 500 | $225 | | | | |
| Crabs: | | | | | | | | |
| Hard | 1, 418, 100 | $24, 909 | | | | | | |
| Soft and peelers | 1, 800 | 306 | | | | | | |
| Shrimp: | | | | | | | | |
| Mississippi | | | | | 4, 493, 300 | 202, 197 | | |
| Louisiana | | | | | 18, 884, 700 | 849, 927 | | |
| Total | 1, 419, 900 | 25, 215 | 7, 500 | 225 | 23, 379, 500 | 1, 052, 259 | 20, 800 | 1, 842 |

| Species | Dredges | | Tongs | | By hand | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Oysters, market: | | | | | | |
| Public, spring, Mississippi | 2, 136, 700 | $93, 975 | 2, 030, 200 | $97, 039 | | |
| Public, fall, Mississippi | 27, 500 | 2, 145 | 307, 300 | 20, 081 | | |
| Public, spring, Louisiana | 8, 087, 000 | 347, 679 | 86, 000 | 4, 105 | | |
| Public, fall, Louisiana | 123, 700 | 5, 813 | 95, 700 | 8, 502 | | |
| Terrapin, diamond-back | | | | | 600 | $48 |
| Total | 10, 374, 900 | 449, 612 | 2, 519, 200 | 129, 727 | 600 | 48 |

### OPERATING UNITS: BY COUNTIES

| Item | Hancock | Harrison | Jackson |
|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* |
| On vessels | 25 | 887 | 71 |
| On boats and shore: | | | |
| Regular | 169 | 1, 429 | 72 |
| Casual | 13 | 84 | 19 |
| Total | 207 | 2, 400 | 162 |
| Vessels: | | | |
| Motor: | | | |
| 5 to 10 tons | 3 | 107 | 3 |
| 11 to 20 tons | 2 | 95 | 6 |
| 21 to 30 tons | | 12 | 2 |

## *Fisheries of Mississippi, 1937*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Hancock | Harrison | Jackson |
|---|---|---|---|
| Vessels—Continued. | | | |
| Motor—Continued. | *Number* | *Number* | *Number* |
| 31 to 40 tons | ----- | 2 | ----- |
| 41 to 50 tons | ----- | 1 | ----- |
| Total | 5 | 217 | 11 |
| Net tonnage | 51 | 2, 624 | 156 |
| Sail: | | | |
| 5 to 10 tons | ----- | 1 | 2 |
| 11 to 20 tons | 1 | 3 | ----- |
| Total | 1 | 4 | 2 |
| Net tonnage | 14 | 53 | 17 |
| Total vessels | 6 | 221 | 13 |
| Total net tonnage | 65 | 2, 677 | 173 |
| Boats: | | | |
| Motor | 39 | 548 | 18 |
| Other | 120 | 441 | 72 |
| Apparatus: | | | |
| Haul seines | ----- | 12 | ----- |
| Length, yards | ----- | 4, 800 | ----- |
| Trammel nets | 21 | 27 | 11 |
| Square yards | 10, 400 | 14, 150 | 5, 300 |
| Lines: | | | |
| Hand | 32 | 47 | 41 |
| Hooks | 32 | 58 | 59 |
| Troll | 6 | ----- | ----- |
| Hooks | 6 | ----- | ----- |
| Trot with baits or snoods | 1 | 149 | 23 |
| Baits or snoods | 450 | 89, 350 | 11, 800 |
| Cast nets | 6 | 30 | 5 |
| Otter trawls, shrimp | 34 | 649 | 12 |
| Yards at mouth | 504 | 9, 946 | 187 |
| Spears | 7 | 23 | 15 |
| Dredges, oyster | 13 | 344 | 28 |
| Yards at mouth | 14 | 346 | 28 |
| Tongs, oyster | 96 | 484 | 41 |

### CATCH; BY COUNTIES

| Species | Hancock | | Harrison | | Jackson | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | 3, 500 | $105 | 3, 000 | $90 | 1, 100 | $38 |
| Drum: | | | | | | |
| Black | 7, 000 | 210 | 3, 300 | 114 | 1, 000 | 38 |
| Red or redfish | 46, 500 | 2, 325 | 58, 300 | 2, 915 | 18, 400 | 920 |
| Flounders | 6, 000 | 540 | 19, 000 | 1, 680 | 2, 800 | 252 |
| Groupers | ----- | ----- | 67, 000 | 2, 010 | 61, 600 | 1, 847 |
| King whiting or "kingfish" | 3, 300 | 99 | 2, 700 | 81 | 2, 400 | 82 |
| Mullet | 23, 000 | 690 | 42, 500 | 1, 275 | 95, 600 | 2, 870 |
| Pompano | ----- | ----- | ----- | ----- | 100 | 15 |
| Sea catfish | 7, 700 | 154 | 2, 300 | 46 | 800 | 16 |
| Sheepshead | 9, 500 | 380 | 3, 600 | 144 | 20, 000 | 800 |
| Snapper, red | ----- | ----- | 87, 000 | 6, 290 | 216, 800 | 14, 961 |
| Spanish mackerel | 700 | 84 | ----- | ----- | ----- | ----- |
| Spot | ----- | ----- | ----- | ----- | 1, 200 | 39 |
| Squeteagues or "sea trout": | | | | | | |
| Spotted | 84, 000 | 7, 561 | 109, 500 | 9, 855 | 17, 100 | 1, 539 |
| White | 28, 000 | 1, 120 | 38, 000 | 1, 520 | 96, 300 | 3, 392 |
| Crabs: | | | | | | |
| Hard | 2, 100 | 37 | 1, 269, 700 | 22, 308 | 163, 000 | 2, 856 |
| Soft and peelers | ----- | ----- | 1, 800 | 306 | ----- | ----- |
| Shrimp: | | | | | | |
| Mississippi | 196, 000 | 8, 812 | 4, 195, 100 | 188, 785 | 102, 200 | 4, 600 |
| Louisiana | 952, 500 | 43, 029 | 17, 852, 200 | 803, 307 | 260, 000 | 11, 691 |
| Oysters, market: | | | | | | |
| Public, spring, Mississippi | 408, 500 | 23, 229 | 3, 244, 200 | 144, 639 | 514, 200 | 23, 146 |
| Public, fall, Mississippi | 50, 600 | 3, 180 | 229, 200 | 13, 822 | 55, 000 | 5, 224 |
| Public, spring, Louisiana | 246, 500 | 10, 794 | 7, 663, 500 | 329, 671 | 263, 000 | 11, 319 |
| Public, fall, Louisiana | 21, 900 | 1, 422 | 197, 500 | 12, 893 | ----- | ----- |
| Terrapin, diamond-back | ----- | ----- | ----- | ----- | 600 | 48 |
| Total | 2, 097, 300 | 103, 771 | 35, 089, 400 | 1, 541, 751 | 1, 893, 200 | 85, 693 |

# LOUISIANA

## *Fisheries of Louisiana, 1937*

### OPERATING UNITS: By gear

| Item | Haul seines | Gill nets, runaround | Trammel nets | Lines | | | Fyke nets | Dip nets, |
|---|---|---|---|---|---|---|---|---|
| | | | | Hand | Trot with baits or snoods | Trot with hooks | | Common |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | 10 | | | | |
| On boats and shore: | | | | | | | | |
| Regular | 514 | 2 | 105 | 148 | 576 | 439 | 53 | 36 |
| Casual | 81 | | 11 | 174 | 291 | 111 | 36 | 29 |
| Total | 595 | 2 | 116 | 332 | 867 | 550 | 89 | 65 |
| Vessels, motor: | | | | | | | | |
| 5 to 10 tons | | | | 1 | | | | |
| 11 to 20 tons | | | | 1 | | | | |
| Total | | | | 2 | | | | |
| Net tonnage | | | | 18 | | | | |
| Boats: | | | | | | | | |
| Motor | 91 | 1 | 50 | 84 | 177 | 174 | 33 | |
| Other | 117 | 1 | 26 | 188 | 700 | 421 | 56 | 34 |
| Apparatus: | | | | | | | | |
| Number | 131 | 1 | 57 | 332 | 876 | 550 | 428 | 65 |
| Length, yards | 27, 570 | | | | | | | |
| Square yards | | 550 | 12, 760 | | | | | |
| Hooks, baits, or snoods | | | | 347 | 220, 550 | 235, 800 | | |

| Item | Dip nets—Continued | Cast nets | Otter trawls, shrimp | Brush traps | Dredges, oyster | Tongs, oyster | By hand, other than for oysters | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| | Drop | | | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | 379 | | 136 | 35 | | 502 |
| On boats and shore: | | | | | | | | |
| Regular | 149 | 73 | 3, 762 | 144 | 130 | 804 | 12 | 5, 565 |
| Casual | 56 | 91 | 23 | | 6 | 7 | 12 | 693 |
| Total | 205 | 164 | 4, 164 | 144 | 272 | 846 | 24 | 6, 760 |
| Vessels, motor: | | | | | | | | |
| 5 to 10 tons | | | 158 | | 25 | 14 | | 179 |
| 11 to 20 tons | | | 23 | | 9 | 1 | | 25 |
| 21 to 30 tons | | | 2 | | | | | 2 |
| Total | | | 183 | | 34 | 15 | | 206 |
| Net tonnage | | | 1, 394 | | 310 | 103 | | 1, 567 |
| Boats: | | | | | | | | |
| Motor | 22 | | 1, 878 | 30 | 34 | 259 | | 2, 468 |
| Other | 168 | 67 | | 114 | | 385 | | 1, 712 |
| Accessory boats | | | | | | 15 | | 15 |
| Apparatus: | | | | | | | | |
| Number | 8, 925 | 160 | 2, 096 | 28, 300 | 129 | 827 | | |
| Yards at mouth | | | 26, 976 | | 129 | | | |

## *Fisheries of Louisiana, 1937*—Continued

### CATCH: BY GEAR

| Species | Haul seines | | Gill nets, runaround | | Trammel nets | | Lines | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hand | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Buffalofish | 421,300 | $22,240 | | | 5,000 | $250 | 1,000 | $55 |
| Cabio or crab eater | | | | | | | 200 | 4 |
| Catfish and bullheads | 377,700 | 28,854 | | | 3,500 | 263 | 16,000 | 1,180 |
| Croaker | 66,500 | 1,766 | | | 24,900 | 811 | 45,200 | 1,300 |
| Drum: | | | | | | | | |
| Black | 100,400 | 2,732 | | | 15,300 | 484 | 49,400 | 1,404 |
| Red or redfish | 257,000 | 16,945 | 1,000 | $60 | 92,600 | 5,900 | 99,000 | 5,918 |
| Flounders | 16,600 | 1,338 | | | 22,300 | 2,187 | | |
| Garfish | 6,000 | 120 | | | 200 | 4 | | |
| Groupers | | | | | | | 6,100 | 244 |
| Jewfish | | | | | | | 17,000 | 765 |
| King whiting or "kingfish" | 1,800 | 44 | | | 24,000 | 820 | | |
| Mullet | 7,700 | 231 | | | 3,000 | 90 | | |
| Paddlefish or spoonbill cat | 500 | 25 | | | | | | |
| Pompano | | | | | | | 800 | 195 |
| Sea catfish | 4,600 | 92 | | | 5,200 | 105 | 4,000 | 82 |
| Sheepshead: | | | | | | | | |
| Fresh-water | 305,900 | 8,113 | | | | | 1,000 | 25 |
| Salt-water | 108,000 | 5,507 | 200 | 10 | 32,700 | 1,640 | 46,100 | 2,917 |
| Snapper, red | | | | | | | 148,100 | 12,068 |
| Spanish mackerel | | | | | | | 2,000 | 200 |
| Spot | 3,200 | 64 | | | 500 | 15 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 332,400 | 29,820 | 5,000 | 450 | 169,200 | 14,004 | 281,100 | 24,293 |
| White | 69,900 | 2,321 | 300 | 12 | 35,900 | 1,928 | 93,500 | 3,932 |
| Tripletail | 1,000 | 50 | | | | | 1,000 | 50 |
| Crabs: | | | | | | | | |
| Hard | 250,000 | 2,610 | | | | | 70,000 | 740 |
| Soft and peelers | 60,000 | 9,700 | | | | | | |
| Shrimp | 2,264,700 | 58,678 | | | | | | |
| Terrapin, diamond-back | 500 | 60 | | | | | | |
| Total | 4,655,700 | 191,310 | 6,500 | 532 | 434,300 | 28,501 | 881,500 | 55,372 |

| Species | Lines—Continued. | | | | Fyke nets | | Dip nets | |
|---|---|---|---|---|---|---|---|---|
| | Trot with baits or snoods | | Trot with hooks | | | | Common | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Buffalofish | | | 22,400 | $1,295 | 233,800 | $10,942 | | |
| Catfish and bullheads | | | 1,190,600 | 91,703 | 4,500 | 370 | | |
| Paddlefish or spoonbill cat | | | 48,400 | 2,784 | 500 | 25 | | |
| Sheepshead, fresh-water | | | 67,800 | 2,210 | 215,500 | 5,835 | | |
| Crabs: | | | | | | | | |
| Hard | 12,887,000 | $141,630 | | | | | 13,600 | $501 |
| Soft and peelers | 32,000 | 5,080 | | | | | 9,800 | 1,437 |
| Total | 12,919,000 | 146,710 | 1,329,200 | 97,992 | 454,300 | 17,172 | 23,400 | 1,938 |

| Species | Dip nets—Continued. | | Cast nets | | Otter trawls | | Brush traps | |
|---|---|---|---|---|---|---|---|---|
| | Drop | | | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders | | | | | 15,000 | $870 | | |
| Crabs: | | | | | | | | |
| Hard | 1,496,500 | $49,330 | | | | | | |
| Soft and peelers | 84,500 | 13,090 | | | | | 143,000 | $21,650 |
| Shrimp | | | 101,000 | $3,530 | 66,415,200 | 2,320,332 | | |
| Total | 1,581,000 | 62,420 | 101,000 | 3,530 | 66,430,200 | 2,321,202 | 143,000 | 21,650 |

## *Fisheries of Louisiana, 1937*—Continued

### CATCH: By gear—Continued

| Species | Dredges | | Tongs | | By hand | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Oysters, market: | | | | | | |
| Public, spring | 1,316,400 | $71,536 | 79,400 | $4,689 | -------- | -------- |
| Public, fall | 51,200 | 4,993 | 11,700 | 1,167 | -------- | -------- |
| Private, spring | 1,561,600 | 100,802 | 2,672,800 | 224,886 | -------- | -------- |
| Private, fall | 240,600 | 22,504 | 2,114,400 | 221,939 | -------- | -------- |
| Terrapin, diamond-back | -------- | -------- | -------- | -------- | 3,200 | $340 |
| Total | 3,169,800 | 199,835 | 4,878,300 | 452,681 | 3,200 | 340 |

### OPERATING UNITS: By parishes

| Item | Calcasieu | Cameron | Iberia | Jefferson | Jefferson Davis | Lafourche | Orleans | Plaquemines |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | -------- | 3 | -------- | 66 | -------- | 105 | 26 | 104 |
| On boats and shore: | | | | | | | | |
| Regular | 15 | 250 | 54 | 1,086 | 30 | 666 | 179 | 785 |
| Casual | 28 | 9 | 57 | 16 | 23 | 3 | 107 | 63 |
| Total | 43 | 262 | 111 | 1,168 | 53 | 774 | 312 | 952 |
| Vessels, motor: | | | | | | | | |
| 5 to 10 tons | | -------- | | 26 | -------- | 43 | 6 | 34 |
| 11 to 20 tons | -------- | 1 | -------- | 3 | -------- | 5 | -------- | 4 |
| 21 to 30 tons | -------- | -------- | -------- | 2 | -------- | -------- | -------- | -------- |
| Total | -------- | 1 | -------- | 31 | -------- | 48 | 6 | 38 |
| Net tonnage | -------- | 11 | -------- | 259 | -------- | 335 | 39 | 280 |
| Boats: | | | | | | | | |
| Motor | 23 | 124 | 48 | 479 | 28 | 289 | 92 | 335 |
| Other | 20 | 13 | 55 | 215 | 22 | 53 | 133 | 236 |
| Accessory boats | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 8 |
| Apparatus: | | | | | | | | |
| Haul seines | 1 | 1 | 6 | 10 | -------- | 5 | 9 | 7 |
| Length, yards | 150 | 350 | 1,800 | 4,070 | -------- | 1,670 | 1,130 | 3,050 |
| Gill nets, runaround | -------- | -------- | 1 | -------- | -------- | -------- | -------- | -------- |
| Square yards | -------- | -------- | 550 | -------- | -------- | -------- | -------- | -------- |
| Trammel nets | -------- | -------- | 3 | 3 | -------- | -------- | 3 | 15 |
| Square yards | -------- | -------- | 500 | 590 | -------- | -------- | 1,600 | 3,080 |
| Lines: | | | | | | | | |
| Hand | 4 | -------- | 5 | 52 | 9 | -------- | 57 | 10 |
| Hooks | 4 | -------- | 5 | 52 | 9 | -------- | 62 | 10 |
| Trot with baits or snoods | 3 | 4 | 4 | 115 | 12 | 3 | 31 | 108 |
| Baits or snoods | 250 | 700 | 800 | 36,000 | 1,200 | 600 | 11,700 | 40,500 |
| Trot with hooks | 31 | -------- | 80 | 17 | 39 | -------- | -------- | -------- |
| Hooks | 33,700 | -------- | 37,500 | 2,400 | 23,500 | -------- | -------- | -------- |
| Fyke nets | 68 | -------- | 47 | -------- | 42 | -------- | -------- | -------- |
| Dip nets, drop | -------- | -------- | -------- | 750 | -------- | -------- | 3,300 | -------- |
| Cast nets | -------- | -------- | -------- | 14 | -------- | -------- | 88 | -------- |
| Otter trawls, shrimp | -------- | 125 | 1 | 467 | 1 | 306 | 45 | 314 |
| Yards at mouth | -------- | 1,517 | 10 | 5,994 | 11 | 4,097 | 609 | 3,845 |
| Brush traps | -------- | -------- | -------- | 28,300 | -------- | -------- | -------- | -------- |
| Dredges, oyster | -------- | -------- | 4 | 2 | -------- | 18 | 12 | 28 |
| Yards at mouth | -------- | -------- | 4 | 2 | -------- | 18 | 12 | 28 |
| Tongs, oyster | -------- | 8 | 7 | 22 | -------- | 110 | 2 | 245 |

NOTE.—The catch as shown above for Louisiana does not include the following products, which were taken by Mississippi craft in Louisiana waters: Shrimp, 19,064,700 pounds, valued at $858,027; oysters, market, spring, 8,173,000 pounds of meats, valued at $351,784; and oysters, market, fall, 219,400 pounds of meats, valued at $14,315. These products have been included with the Mississippi catch.

### *Fisheries of Louisiana, 1937*—Continued

OPERATING UNITS: BY PARISHES—Continued

| Item | St. Bernard | St. Charles | St. John the Baptist | St. Mary | St. Tammany | Tangipahoa | Terrebonne | Vermilion |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 29 | -------- | -------- | 56 | 10 | -------- | 99 | 4 |
| On boats and shore: | | | | | | | | |
| Regular | 370 | 116 | 2 | 554 | 77 | 36 | 1,299 | 46 |
| Casual | 67 | 38 | 9 | 100 | 70 | 36 | 32 | 35 |
| Total | 466 | 154 | 11 | 710 | 157 | 72 | 1,430 | 85 |
| Vessels, motor: | | | | | | | | |
| 5 to 10 tons | 10 | -------- | -------- | 16 | 1 | -------- | 42 | 1 |
| 11 to 20 tons | -------- | -------- | -------- | 7 | 2 | -------- | 3 | -------- |
| Total | 10 | -------- | -------- | 23 | 3 | -------- | 45 | 1 |
| Net tonnage | 76 | -------- | -------- | 225 | 35 | -------- | 299 | 8 |
| Boats: | | | | | | | | |
| Motor | 159 | 48 | 1 | 187 | 11 | 31 | 589 | 24 |
| Other | 130 | 85 | 7 | 420 | 94 | 29 | 174 | 26 |
| Accessory boats | -------- | -------- | -------- | -------- | 1 | -------- | 6 | -------- |
| Apparatus: | | | | | | | | |
| Haul seines | 41 | 5 | 4 | 11 | 5 | 5 | 11 | 10 |
| Length, yards | 4,150 | 1,330 | 120 | 3,830 | 850 | 2,000 | 1,320 | 1,750 |
| Trammel nets | 8 | -------- | -------- | -------- | -------- | 3 | 19 | 3 |
| Square yards | 1,560 | -------- | -------- | -------- | -------- | 1,200 | 3,080 | 1,150 |
| Lines: | | | | | | | | |
| Hand | 25 | 12 | -------- | 42 | 69 | -------- | 47 | -------- |
| Hooks | 25 | 12 | -------- | 52 | 69 | -------- | 47 | -------- |
| Trot with baits or snoods | 120 | 70 | -------- | 380 | 1 | -------- | 8 | 17 |
| Baits or snoods | 24,300 | 20,800 | -------- | 78,000 | 850 | -------- | 1,150 | 3,700 |
| Trot with hooks | -------- | 76 | 2 | 267 | -------- | 38 | -------- | -------- |
| Hooks | -------- | 22,500 | 900 | 81,500 | -------- | 33,800 | -------- | -------- |
| Fyke net | -------- | -------- | -------- | 237 | -------- | 34 | -------- | -------- |
| Dip nets: | | | | | | | | |
| Common | -------- | -------- | -------- | -------- | 53 | 12 | -------- | -------- |
| Drop | 1,850 | -------- | 125 | -------- | 2,300 | 600 | -------- | -------- |
| Cast nets | -------- | -------- | 4 | -------- | 34 | 20 | -------- | -------- |
| Otter trawls, shrimp | 133 | 30 | -------- | 119 | 10 | -------- | 537 | 8 |
| Yards at mouth | 1,653 | 394 | -------- | 1,727 | 126 | -------- | 6,908 | 85 |
| Dredges, oyster | 18 | -------- | -------- | 7 | 6 | -------- | 23 | 11 |
| Yards at mouth | 18 | -------- | -------- | 7 | 6 | -------- | 23 | 11 |
| Tongs, oyster | 6 | -------- | -------- | 6 | 13 | -------- | 404 | 4 |

CATCH: BY PARISHES

| Species | Calcasieu | | Cameron | | Iberia | | Jefferson | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Buffalofish | 76,300 | $3,052 | -------- | -------- | 41,500 | $1,660 | 400 | $20 |
| Cabio or crab eater | -------- | -------- | -------- | -------- | -------- | -------- | 200 | 4 |
| Catfish and bullheads | 15,800 | 1,422 | -------- | -------- | 106,000 | 9,540 | 25,000 | 1,750 |
| Croaker | 1,000 | 40 | -------- | -------- | 2,200 | 88 | 4,500 | 90 |
| Drum: | | | | | | | | |
| Black | -------- | -------- | 500 | $15 | 500 | 20 | 14,000 | 180 |
| Red or redfish | 1,400 | 84 | 1,000 | 60 | 7,700 | 462 | 23,000 | 1,250 |
| Flounders | -------- | -------- | 100 | 10 | -------- | -------- | 400 | 32 |
| Garfish | -------- | -------- | 1,000 | 20 | 200 | 4 | -------- | -------- |
| Paddlefish or spoonbill cat | 5,400 | 270 | -------- | -------- | 3,000 | 150 | -------- | -------- |
| Pompano | -------- | -------- | -------- | -------- | -------- | -------- | 800 | 195 |
| Sea catfish | -------- | -------- | 300 | 6 | -------- | -------- | 3,000 | 60 |
| Sheepshead: | | | | | | | | |
| Fresh-water | 7,300 | 255 | -------- | -------- | 127,000 | 4,445 | -------- | -------- |
| Salt-water | 300 | 15 | 500 | 25 | 3,700 | 185 | 4,000 | 200 |
| Spanish mackerel | -------- | -------- | -------- | -------- | -------- | -------- | 2,000 | 200 |
| Squeteague or "sea trout": | | | | | | | | |
| Spotted | 4,000 | 400 | 8,000 | 800 | 17,000 | 1,530 | 96,800 | 6,976 |
| White | -------- | -------- | 500 | 20 | 4,600 | 184 | 28,000 | 560 |
| Tripletail | -------- | -------- | -------- | -------- | -------- | -------- | 1,000 | 50 |
| Crabs: | | | | | | | | |
| Hard | 5,000 | 125 | 10,000 | 250 | 4,500 | 130 | 3,363,500 | 35,920 |
| Soft and peelers | -------- | -------- | -------- | -------- | -------- | -------- | 171,400 | 25,910 |
| Shrimp | -------- | -------- | 3,940,400 | 157,640 | 23,400 | 1,020 | 14,781,800 | 469,669 |
| Oysters, market: | | | | | | | | |
| Public, spring | -------- | -------- | 6,100 | 590 | -------- | -------- | 46,400 | 2,580 |
| Public, fall | -------- | -------- | 5,800 | 580 | 1,900 | 216 | -------- | -------- |
| Private, spring | -------- | -------- | -------- | -------- | 17,900 | 1,509 | 101,000 | 8,020 |
| Private, fall | -------- | -------- | -------- | -------- | 15,700 | 1,803 | 71,400 | 7,436 |
| Total | 116,500 | 5,663 | 3,974,200 | 160,016 | 376,800 | 22,946 | 18,738,600 | 561,102 |

## *Fisheries of Louisiana, 1937*—Continued

CATCH: BY PARISHES—Continued

| Species | Jefferson Davis | | Lafourche | | Orleans | | Plaquemines | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Buffalofish | 32,000 | $1,120 | | | | | | |
| Catfish and bullheads | 83,000 | 7,050 | | | | | | |
| Croaker | 500 | 20 | | | 16,000 | $405 | 22,200 | $705 |
| Drum: | | | | | | | | |
| Black | | | | | 12,000 | 360 | 10,900 | 299 |
| Red or redfish | | | | | 71,000 | 4,045 | 48,700 | 3,425 |
| Flounders | | | | | 1,200 | 96 | 22,000 | 2,198 |
| Grouper | | | | | 6,100 | 244 | | |
| Jewfish | | | | | 17,000 | 765 | | |
| King whiting or "kingfish" | | | | | | | 23,000 | 790 |
| Mullet | | | | | 4,500 | 135 | | |
| Paddlefish or spoonbill cat | 1,000 | 50 | | | | | | |
| Sea catfish | | | | | | | 5,300 | 106 |
| Sheepshead: | | | | | | | | |
| Fresh-water | 28,000 | 840 | | | | | | |
| Salt-water | | | | | 32,900 | 1,545 | 21,000 | 1,075 |
| Snapper, red | | | | | 45,000 | 3,820 | | |
| Spot | | | | | 500 | 10 | 1,500 | 35 |
| Squeteague or "sea trout": | | | | | | | | |
| Spotted | 5,000 | 500 | | | 73,500 | 7,025 | 101,000 | 10,100 |
| White | | | | | 40,500 | 1,575 | 26,200 | 936 |
| Tripletail | | | | | | | 1,000 | 50 |
| Crabs: | | | | | | | | |
| Hard | 25,000 | 625 | 12,000 | $140 | 857,000 | 30,960 | 2,080,000 | 23,280 |
| Soft and peelers | | | | | 11,500 | 1,725 | | |
| Shrimp | 35,000 | 1,400 | 10,951,600 | 399,138 | 1,449,000 | 50,209 | 9,395,500 | 372,694 |
| Oysters, market: | | | | | | | | |
| Public, spring | | | | | 21,900 | 1,876 | 639,500 | 34,450 |
| Public, fall | | | | | 15,500 | 1,498 | 16,100 | 1,580 |
| Private, spring | | | 698,400 | 46,272 | 245,800 | 20,654 | 1,322,100 | 121,029 |
| Private, fall | | | 450,600 | 49,283 | 161,000 | 16,100 | 1,057,800 | 114,244 |
| Total | 209,500 | 11,605 | 12,112,600 | 494,833 | 3,081,900 | 143,047 | 14,793,800 | 686,996 |

| Species | St. Bernard | | St. Charles | | St. John the Baptist | | St. Mary | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Buffalofish | | | 50,000 | $2,500 | | | 438,000 | $24,165 |
| Catfish and bullheads | | | 301,700 | 19,002 | 4,900 | $368 | 851,700 | 68,136 |
| Croaker | 56,400 | $1,218 | | | | | | |
| Drum: | | | | | | | | |
| Black | 75,800 | 1,644 | | | | | | |
| Red or redfish | 122,900 | 8,603 | | | | | | |
| Flounders | 11,900 | 952 | | | | | 4,000 | 200 |
| Paddlefish or spoonbill cat | | | | | | | 36,400 | 2,184 |
| Sea catfish | 1,600 | 32 | | | | | | |
| Sheepshead: | | | | | | | | |
| Fresh-water | | | 2,000 | 40 | | | 405,000 | 10,007 |
| Salt-water | 74,800 | 4,280 | | | | | | |
| Snapper, red | | | | | | | 103,100 | 8,248 |
| Spot | 1,700 | 34 | | | | | | |
| Squeteague or "sea trout": | | | | | | | | |
| Spotted | 177,000 | 15,780 | | | | | | |
| White | 30,000 | 1,454 | | | | | | |
| Crabs: | | | | | | | | |
| Hard | 1,775,000 | 17,950 | 223,700 | 2,237 | 22,000 | 880 | 5,728,800 | 57,288 |
| Soft and peelers | 93,000 | 15,040 | | | 500 | 75 | | |
| Shrimp | 4,332,200 | 151,618 | 944,500 | 32,113 | 10,500 | 368 | 5,318,600 | 198,745 |
| Oysters, market: | | | | | | | | |
| Public, spring | 433,200 | 24,180 | | | | | | |
| Public, fall | | | | | | | 3,600 | 297 |
| Private, spring | 36,400 | 2,700 | | | | | 161,600 | 12,543 |
| Private, fall | 1,000 | 88 | | | | | 40,100 | 3,475 |
| Terrapin, diamond-back | 1,500 | 180 | | | | | | |
| Total | 7,224,400 | 245,753 | 1,521,900 | 55,892 | 37,900 | 1,691 | 13,090,900 | 385,288 |

*Fisheries of Louisiana 1937*—Continued

CATCH: BY PARISHES—Continued

| Species | St. Tammany | | Tangipahoa | | Terrebonne | | Vermilion | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Buffalofish | 500 | $25 | 37,000 | $1,850 | 7,800 | $390 | -------- | -------- |
| Catfish and bullheads | 2,500 | 175 | 160,500 | 12,043 | 41,200 | 2,884 | -------- | -------- |
| Croaker | 13,200 | 434 | -------- | -------- | 12,600 | 497 | 8,000 | $380 |
| Drum: | | | | | | | | |
| Black | -------- | -------- | -------- | -------- | 46,000 | 1,840 | 5,400 | 262 |
| Red or redfish | 21,700 | 1,412 | 3,500 | 280 | 131,200 | 7,872 | 17,500 | 1,330 |
| Flounders | -------- | -------- | -------- | -------- | 14,000 | 880 | 300 | 27 |
| Garfish | -------- | -------- | -------- | -------- | -------- | -------- | 5,000 | 100 |
| King whiting or "kingfish" | -------- | -------- | -------- | -------- | 2,800 | 74 | -------- | -------- |
| Mullet | 800 | 24 | -------- | -------- | 5,400 | 162 | -------- | -------- |
| Paddlefish or spoonbill cat. | -------- | -------- | 3,600 | 180 | -------- | -------- | -------- | -------- |
| Sea catfish | 500 | 10 | -------- | -------- | 3,100 | 65 | -------- | -------- |
| Sheepshead: | | | | | | | | |
| Fresh-water | -------- | -------- | 12,000 | 240 | 8,900 | 356 | -------- | -------- |
| Salt-water | 27,200 | 1,519 | -------- | -------- | 10,600 | 530 | 12,000 | 700 |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 112,200 | 11,060 | -------- | -------- | 159,200 | 11,146 | 34,000 | 3,250 |
| White | 43,500 | 1,740 | -------- | -------- | 17,700 | 1,380 | 8,600 | 344 |
| Crabs: | | | | | | | | |
| Hard | 376,000 | 18,186 | 128,000 | 5,120 | 61,000 | 610 | 45,600 | 1,110 |
| Soft and peelers | 45,400 | 7,155 | 7,500 | 1,052 | -------- | -------- | -------- | -------- |
| Shrimp | 351,300 | 12,771 | 20,000 | 700 | 16,961,400 | 525,135 | 265,700 | 9,320 |
| Oysters, market: | | | | | | | | |
| Public, spring | 248,700 | 12,549 | -------- | -------- | -------- | -------- | -------- | -------- |
| Public, fall | 20,000 | 1,989 | -------- | -------- | -------- | -------- | -------- | -------- |
| Private, spring | -------- | -------- | -------- | -------- | 1,370,200 | 97,839 | 281,000 | 15,122 |
| Private, fall | -------- | -------- | -------- | -------- | 519,100 | 48,598 | 38,300 | 3,416 |
| Terrapin, diamond-back | -------- | -------- | -------- | -------- | 2,200 | 220 | -------- | -------- |
| Total | 1,263,500 | 69,049 | 372,100 | 21,465 | 19,374,400 | 700,478 | 721,400 | 35,361 |

## TEXAS

*Fisheries of Texas, 1937*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Gill nets | | Trammel nets | Lines | | | |
|---|---|---|---|---|---|---|---|---|
| | | Run-around | Stake | | Hand | Troll | Trot with baits or snoods | Trot with hooks |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | -------- | -------- | -------- | -------- | 64 | -------- | -------- | -------- |
| On boats and shore: | | | | | | | | |
| Regular | 127 | 80 | 141 | 188 | 167 | 4 | 17 | 103 |
| Casual | 7 | -------- | -------- | 21 | 131 | 3 | 32 | 2 |
| Total | 134 | 80 | 141 | 209 | 362 | 7 | 49 | 105 |
| Vessels, motor: | | | | | | | | |
| 5 to 10 tons | -------- | -------- | -------- | -------- | 1 | -------- | -------- | -------- |
| 11 to 20 tons | -------- | -------- | -------- | -------- | 5 | -------- | -------- | -------- |
| 21 to 30 tons | -------- | -------- | -------- | -------- | 2 | -------- | -------- | -------- |
| 31 to 40 tons | -------- | -------- | -------- | -------- | 1 | -------- | -------- | -------- |
| Total | -------- | -------- | -------- | -------- | 9 | -------- | -------- | -------- |
| Net tonnage | -------- | -------- | -------- | -------- | 152 | -------- | -------- | -------- |
| Boats: | | | | | | | | |
| Motor | 20 | 32 | 29 | 105 | 91 | 4 | 9 | 40 |
| Other | 7 | 7 | 53 | 4 | 119 | -------- | 40 | 45 |
| Apparatus: | | | | | | | | |
| Number | 44 | 131 | 352 | 106 | 362 | 7 | 49 | 77 |
| Length, yards | 15,150 | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Square yards | -------- | 32,650 | 84,090 | 57,700 | -------- | -------- | -------- | -------- |
| Hooks, baits, or snoods | -------- | -------- | -------- | -------- | 441 | 7 | 14,700 | 64,500 |

*Fisheries of Texas, 1937*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Dip nets | Otter trawls, shrimp | Pots, crab | Spears | Dredges, oyster | Tongs, oyster | By hand, oyster | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | -------- | 90 | -------- | -------- | 19 | -------- | -------- | 161 |
| On boats and shore: | | | | | | | | |
| Regular | 24 | 770 | 22 | 52 | 159 | 60 | -------- | 1,382 |
| Casual | 10 | -------- | 7 | 82 | -------- | 52 | 4 | 296 |
| Total | 34 | 860 | 29 | 134 | 178 | 112 | 4 | 1,839 |
| Vessels, motor: | | | | | | | | |
| 5 to 10 tons | -------- | 36 | -------- | -------- | 4 | -------- | -------- | 36 |
| 11 to 20 tons | -------- | 9 | -------- | -------- | 1 | -------- | -------- | 14 |
| 21 to 30 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 2 |
| 31 to 40 tons | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 1 |
| Total | -------- | 45 | -------- | -------- | 5 | -------- | -------- | 53 |
| Net tonnage | -------- | 389 | -------- | -------- | 46 | -------- | -------- | 535 |
| Boats: | | | | | | | | |
| Motor | -------- | 385 | 10 | -------- | 53 | 31 | -------- | 624 |
| Other | 13 | -------- | 12 | 9 | -------- | 54 | -------- | 294 |
| Apparatus: | | | | | | | | |
| Number | 34 | 430 | 800 | 134 | 58 | 110 | -------- | -------- |
| Square yards | -------- | 6,677 | -------- | -------- | -------- | -------- | -------- | -------- |
| Yards at mouth | -------- | -------- | -------- | -------- | 60 | -------- | -------- | -------- |

CATCH: BY GEAR

| Species | Haul seines | | Gill nets | | | | Trammel nets | |
|---|---|---|---|---|---|---|---|---|
| | | | Runaround | | Stake | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | 6,700 | $201 | 11,600 | $260 | 16,100 | $341 | 30,400 | $865 |
| Drum: | | | | | | | | |
| Black | 150,700 | 5,539 | 346,700 | 7,576 | 512,400 | 10,651 | 141,900 | 4,482 |
| Red or redfish | 152,300 | 11,193 | 149,500 | 10,511 | 149,300 | 10,150 | 266,900 | 17,124 |
| Flounders | 5,600 | 513 | 3,300 | 312 | 500 | 43 | 8,500 | 764 |
| King whiting or "kingfish" | -------- | -------- | -------- | -------- | -------- | -------- | 3,000 | 65 |
| Mullet | -------- | -------- | 1,300 | 36 | 400 | 11 | 4,900 | 112 |
| Pompano | -------- | -------- | -------- | -------- | 200 | 30 | 4,200 | 843 |
| Sea catfish | 2,000 | 60 | 5,900 | 314 | 600 | 17 | 8,400 | 220 |
| Sheepshead | 8,900 | 267 | 4,200 | 150 | 4,800 | 129 | 21,500 | 645 |
| Snook or sergeantfish | 3,000 | 210 | 1,000 | 40 | 2,000 | 80 | 1,000 | 70 |
| Spanish mackerel | 4,300 | 341 | 4,100 | 249 | 1,800 | 116 | 9,400 | 624 |
| Spot | 3,000 | 60 | 1,000 | 20 | -------- | -------- | 8,000 | 160 |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 239,000 | 20,580 | 512,200 | 43,833 | 559,300 | 47,760 | 478,600 | 39,526 |
| White | 500 | 15 | 3,100 | 83 | 1,000 | 26 | 10,400 | 297 |
| Total | 576,000 | 38,979 | 1,043,900 | 63,384 | 1,248,400 | 69,354 | 997,100 | 65,797 |

## *Fisheries of Texas, 1937*—Continued

### CATCH: By gear—Continued

| Species | Lines | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Hand | | Troll | | Trot with baits or snoods | | Trot with hooks | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Buffalofish | | | | | | | 3,400 | $204 |
| Catfish and bullheads | | | | | | | 66,600 | 3,325 |
| Croaker | 13,800 | $394 | | | | | 4,000 | 120 |
| Drum: | | | | | | | | |
| Black | 137,700 | 3,951 | | | | | 259,600 | 7,731 |
| Red or redfish | 98,000 | 7,241 | | | | | 138,500 | 8,447 |
| Flounders | 2,500 | 232 | | | | | 2,700 | 248 |
| Groupers | 19,600 | 638 | | | | | | |
| Jewfish | 2,700 | 91 | | | | | | |
| Kingfish or "king mackerel" | | | 3,000 | $107 | | | | |
| Pompano | 100 | 15 | | | | | | |
| Sea catfish | 2,100 | 62 | | | | | 12,300 | 311 |
| Sheepshead | 1,700 | 50 | | | | | | |
| Snapper, red | 1,141,200 | 79,781 | | | | | | |
| Snook or sergeantfish | 2,200 | 154 | | | | | | |
| Spanish mackerel | 17,200 | 1,081 | 2,000 | 100 | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 234,200 | 17,460 | | | | | 66,500 | 5,987 |
| White | 4,500 | 131 | | | | | | |
| Crabs, hard | | | | | 301,800 | $7,707 | | |
| Total | 1,677,500 | 111,281 | 5,000 | 207 | 301,800 | 7,707 | 553,600 | 26,373 |

| Species | Dip nets | | Otter trawls | | Pots | | Spears | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders | | | | | | | 87,500 | $8,058 |
| Crabs, hard | 212,900 | $5,650 | | | 406,900 | $11,220 | | |
| Shrimp | | | 16,904,800 | $551,404 | | | | |
| Total | 212,900 | 5,650 | 16,904,800 | 551,404 | 406,900 | 11,220 | 87,500 | 8,058 |

| Species | Dredges | | Tongs | | By hand | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Oysters, market: | | | | | | |
| Public, spring | 508,800 | $35,550 | 106,500 | $8,902 | 2,700 | $245 |
| Public, fall | 446,300 | 34,112 | 123,600 | 11,666 | 1,700 | 156 |
| Total | 955,100 | 69,662 | 230,100 | 20,568 | 4,400 | 401 |

### OPERATING UNITS: By counties

| Item | Aransas | Brazoria | Calhoun | Cameron | Galveston | Harris |
|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | |
| On vessels | 2 | | 10 | 12 | 88 | |
| On boats and shore: | | | | | | |
| Regular | 130 | 9 | 179 | 163 | 244 | 26 |
| Casual | 34 | 6 | 12 | 15 | 54 | 15 |
| Total | 166 | 15 | 201 | 190 | 386 | 41 |
| Vessels, motor: | | | | | | |
| 5 to 10 tons | | | 4 | 1 | 14 | |
| 11 to 20 tons | 1 | | | 1 | 8 | |
| 21 to 30 tons | | | | | 2 | |
| 31 to 40 tons | | | | | 1 | |
| Total | 1 | | 4 | 2 | 25 | |
| Net tonnage | 13 | | 26 | 20 | 294 | |
| Boats: | | | | | | |
| Motor | 53 | 5 | 101 | 41 | 121 | 16 |
| Other | 24 | 4 | 30 | 41 | 42 | 12 |
| Apparatus: | | | | | | |
| Haul seines | 3 | | 3 | | 7 | |
| Length, yards | 300 | | 300 | | 1,750 | |

*Fisheries of Texas, 1937*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Aransas | Brazoria | Calhoun | Cameron | Galveston | Harris |
|---|---|---|---|---|---|---|
| Apparatus—Continued. | | | | | | |
| Gill nets: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Runaround | 34 | --------- | --------- | 70 | --------- | --------- |
| Square yards | 7,100 | --------- | --------- | 17,500 | --------- | --------- |
| Stake | 19 | --------- | --------- | 267 | --------- | --------- |
| Square yards | 3,600 | --------- | --------- | 64,100 | --------- | --------- |
| Trammel nets | 21 | --------- | 27 | --------- | 13 | 9 |
| Square yards | 14,000 | --------- | 15,000 | --------- | 4,500 | 2,700 |
| Lines: | | | | | | |
| Hand | 35 | 9 | 10 | 57 | 84 | --------- |
| Hooks | 35 | 9 | 10 | 57 | 156 | --------- |
| Troll | --------- | --------- | --------- | 5 | --------- | --------- |
| Hooks | --------- | --------- | --------- | 5 | --------- | --------- |
| Trot with baits or snoods | --------- | --------- | --------- | --------- | 34 | 11 |
| Baits or snoods | --------- | --------- | --------- | --------- | 10,500 | 3,100 |
| Trot with hooks | --------- | 5 | 18 | --------- | --------- | 2 |
| Hooks | --------- | 1,800 | 4,500 | --------- | --------- | 700 |
| Dip nets | 28 | --------- | --------- | --------- | --------- | --------- |
| Otter trawls, shrimp | 27 | 1 | 66 | 28 | 103 | --------- |
| Yards at mouth | 436 | 13 | 890 | 462 | 1,762 | --------- |
| Pots, crab | --------- | --------- | 660 | --------- | 140 | --------- |
| Spears | 14 | --------- | 14 | 4 | 4 | --------- |
| Dredges, oyster | 18 | --------- | 8 | --------- | 3 | 1 |
| Yards at mouth | 20 | --------- | 8 | --------- | 3 | 1 |
| Tongs, oyster | 9 | 3 | 18 | 3 | 21 | 12 |

| Item | Jefferson | Kleberg | Matagorda | Nueces | San Patricio | Willacy |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 2 | --------- | 25 | 2 | 20 | --------- |
| On boats and shore: | | | | | | |
| Regular | 71 | 20 | 179 | 174 | 177 | 10 |
| Casual | 2 | --------- | 27 | 86 | 33 | 12 |
| Total | 75 | 20 | 231 | 262 | 230 | 22 |
| Vessels, motor: | | | | | | |
| 5 to 10 tons | 1 | --------- | 8 | 1 | 7 | --------- |
| 11 to 20 tons | --------- | --------- | 1 | --------- | 3 | --------- |
| Total | 1 | --------- | 9 | 1 | 10 | --------- |
| Net tonnage | 8 | --------- | 82 | 7 | 85 | --------- |
| Boats: | | | | | | |
| Motor | 34 | 4 | 87 | 65 | 92 | 5 |
| Other | 2 | 12 | 14 | 78 | 25 | 10 |
| Apparatus: | | | | | | |
| Haul seines | --------- | --------- | 1 | 28 | 2 | --------- |
| Length, yards | --------- | --------- | 100 | 12,500 | 200 | --------- |
| Gill nets: | | | | | | |
| Runaround | --------- | --------- | 3 | 22 | 2 | --------- |
| Square yards | --------- | --------- | 1,650 | 5,800 | 600 | --------- |
| Stake | --------- | --------- | --------- | 60 | 6 | --------- |
| Square yards | --------- | --------- | --------- | 15,200 | 1,190 | --------- |
| Trammel nets | --------- | --------- | 16 | --------- | 20 | --------- |
| Square yards | --------- | --------- | 8,900 | --------- | 12,600 | --------- |
| Lines: | | | | | | |
| Hand | 7 | 14 | --------- | 84 | 44 | 18 |
| Hooks | 14 | 14 | --------- | 84 | 44 | 18 |
| Troll | --------- | --------- | --------- | --------- | 2 | --------- |
| Hooks | --------- | --------- | --------- | --------- | 2 | --------- |
| Trot with baits or snoods | 2 | --------- | --------- | 2 | --------- | --------- |
| Baits or snoods | 200 | --------- | --------- | 900 | --------- | --------- |
| Trot with hooks | --------- | 16 | --------- | 21 | 5 | 10 |
| Hooks | --------- | 17,000 | --------- | 22,000 | 4,500 | 14,000 |
| Dip nets | --------- | --------- | --------- | 3 | 3 | --------- |
| Otter trawls, shrimp | 33 | --------- | 61 | 29 | 82 | --------- |
| Yards at mouth | 584 | --------- | 928 | 407 | 1,195 | --------- |
| Spears | --------- | --------- | 24 | 64 | 10 | --------- |
| Dredges, oyster | --------- | --------- | 24 | 4 | --------- | --------- |
| Yards at mouth | --------- | --------- | 24 | 4 | --------- | --------- |
| Tongs, oyster | --------- | --------- | 23 | 18 | 3 | --------- |

## *Fisheries of Texas, 1937*—Continued

### CATCH: BY COUNTIES

| Species | Aransas | | Brazoria | | Calhoun | | Cameron | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Buffalofish | | | | | 800 | $48 | | |
| Catfish and bullheads | | | | | 55,700 | 2,785 | | |
| Croaker | 9,200 | $276 | | | 6,100 | 183 | 25,000 | $500 |
| Drum: | | | | | | | | |
| Black | 62,800 | 2,220 | 600 | $24 | 67,100 | 2,044 | 837,900 | 16,758 |
| Red or redfish | 66,700 | 4,759 | 12,400 | 992 | 75,200 | 5,075 | 206,400 | 14,181 |
| Flounders | 22,200 | 1,776 | 100 | 10 | 17,100 | 1,690 | 3,200 | 316 |
| Groupers | | | 200 | 6 | | | 5,000 | 200 |
| Jewfish | | | | | | | 1,000 | 40 |
| Kingfish or "king mackerel" | | | | | | | 2,600 | 91 |
| Mullet | 200 | 6 | | | | | | |
| Pompano | | | | | 3,900 | 780 | 200 | 30 |
| Sea catfish | 9,000 | 403 | | | 16,900 | 422 | | |
| Sheepshead | 2,200 | 66 | | | 5,600 | 168 | 4,000 | 95 |
| Snapper, red | | | 24,000 | 1,680 | | | 104,600 | 7,168 |
| Snook or sargeantfish | | | | | 4,000 | 280 | 3,000 | 120 |
| Spanish mackerel | 9,900 | 594 | | | 5,000 | 347 | 4,800 | 240 |
| Spot | | | | | | | 1,000 | 20 |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 122,100 | 9,768 | 200 | 20 | 135,100 | 10,974 | 987,300 | 81,075 |
| White | 5,200 | 155 | | | 1,600 | 48 | 1,800 | 36 |
| Crabs, hard | 194,000 | 5,190 | | | 333,200 | 9,210 | | |
| Shrimp | 909,200 | 28,343 | 24,000 | 960 | 1,865,800 | 57,275 | 830,200 | 31,497 |
| Oysters, market: | | | | | | | | |
| Public, spring | 100,400 | 7,596 | 2,300 | 188 | 82,400 | 6,317 | 5,400 | 490 |
| Public, fall | 79,500 | 7,082 | 5,900 | 576 | 80,600 | 6,993 | 3,500 | 320 |
| Total | 1,592,600 | 68,234 | 69,700 | 4,456 | 2,756,100 | 104,639 | 3,026,900 | 153,177 |

| Species | Galveston | | Harris | | Jefferson | | Kleberg | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | 9,000 | $225 | | | | | | |
| Drum: | | | | | | | | |
| Black | 17,000 | 510 | | | | | 159,800 | $4,794 |
| Red or redfish | 101,000 | 6,060 | 26,200 | $1,724 | | | 25,800 | 1,806 |
| Flounders | 3,700 | 318 | | | | | 1,100 | 99 |
| Groupers | 11,400 | 342 | | | 3,000 | $90 | | |
| Jewfish | 1,000 | 30 | | | 700 | 21 | | |
| King whiting or "kingfish" | 2,000 | 40 | | | | | | |
| Mullet | 2,000 | 40 | | | | | | |
| Sea catfish | | | 500 | 15 | | | | |
| Sheepshead | 10,000 | 300 | | | | | | |
| Snapper, red | 867,500 | 60,725 | | | 140,000 | 9,800 | | |
| Spanish mackerel | 7,200 | 576 | | | | | | |
| Spot | 6,000 | 120 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 158,000 | 12,640 | 53,000 | 4,480 | | | 30,500 | 2,745 |
| White | 1,500 | 30 | | | | | | |
| Crabs, hard | 223,200 | 5,785 | 126,900 | 3,188 | 5,500 | 200 | | |
| Shrimp | 4,669,000 | 172,381 | | | 1,428,400 | 52,849 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 39,200 | 3,170 | 36,900 | 3,180 | | | | |
| Public, fall | 19,500 | 2,020 | 25,600 | 2,375 | | | | |
| Total | 6,148,200 | 265,312 | 269,100 | 14,962 | 1,577,600 | 62,960 | 217,200 | 9,444 |

*Fisheries of Texas, 1937*—Continued

CATCH: By counties—Continued

| Species | Matagorda | | Nueces | | San Patricio | | Willacy | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Buffalofish | | | 2,600 | $156 | | | | |
| Catfish and bullheads | | | 10,900 | 540 | | | | |
| Croaker | 7,800 | $234 | 2,900 | 87 | 22,600 | $676 | | |
| Drum: | | | | | | | | |
| Black | 64,500 | 1,935 | 175,200 | 6,726 | 63,100 | 2,514 | 101,000 | $2,405 |
| Red or redfish | 92,000 | 5,920 | 242,200 | 16,108 | 80,500 | 6,340 | 26,100 | 1,701 |
| Flounders | 20,100 | 1,910 | 30,100 | 2,880 | 12,500 | 1,126 | 500 | 45 |
| Kingfish or "king mackerel" | | | | | 400 | 16 | | |
| King whiting or "kingfish" | 1,000 | 25 | | | | | | |
| Mullet | 2,800 | 69 | 1,600 | 44 | | | | |
| Pompano | 300 | 63 | | | 100 | 15 | | |
| Sea catfish | | | 1,000 | 30 | 3,300 | 99 | 600 | 15 |
| Sheepshead | 7,600 | 228 | 11,100 | 363 | 600 | 21 | | |
| Snapper, red | | | 5,100 | 408 | | | | |
| Snook or sargeantfish | | | | | 2,200 | 154 | | |
| Spanish mackerel | 2,400 | 168 | 800 | 64 | 8,600 | 516 | 100 | 6 |
| Spot | 2,000 | 40 | 3,000 | 60 | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 116,500 | 9,875 | 317,500 | 28,305 | 169,600 | 15,264 | | |
| White | 4,400 | 133 | 1,000 | 30 | 4,000 | 120 | | |
| Crabs, hard | | | 32,900 | 844 | 5,900 | 160 | | |
| Shrimp | 3,099,000 | 84,623 | 967,300 | 30,019 | 3,111,900 | 93,457 | | |
| Oysters: | | | | | | | | |
| Public, spring | 325,100 | 21,640 | 22,800 | 1,853 | 3,500 | 263 | | |
| Public, fall | 292,900 | 20,966 | 63,300 | 5,532 | 800 | 70 | | |
| Total | 4,038,400 | 147,829 | 1,891,300 | 94,049 | 3,489,600 | 120,811 | 128,300 | 4,172 |

## FISHERIES OF THE PACIFIC COAST STATES[9]

The yield of the commercial fisheries of the Pacific Coast States (Washington, Oregon, and California) during 1937 amounted to 1,576,877,400 pounds, valued at $28,776,385 to the fishermen, representing a decrease of 18 percent in volume, but an increase of 16 percent in value as compared with the catch in the previous year. These fisheries gave employment to 21,555 fishermen as compared with 20,620 in 1936.

There were 330 fishery wholesale and manufacturing establishments in the three States in 1937, as compared with 339 in 1936. During 1937 these establishments employed 19,792 persons, paid $10,669,409 in salaries and wages, and produced manufactured products (canned, cured, packaged, and byproducts) valued at $56,149,695. In 1936 the wholesale and manufacturing firms employed 16,589 persons, paid $9,365,375 in salaries and wages, and produced manufactured products valued at $52,498,170.

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[9] Data on the operating units and catch of the fisheries of the Pacific Coast States have been taken largely from statistics collected by the various State agencies. Supplementary surveys, compilations, and analyses have been made by agents of this Bureau in order that the figures may be presented in a manner comparable with those of other sections. While statistics of the fisheries of California are for the calendar year, those for Oregon and Washington are for the fiscal year ending March 31, 1938, except that statistics of the halibut fishery in these latter States are for the calendar year. For a clearer understanding of the statistics published in this section the reader is referred to the section in the latter part of this document entitled "Statistical survey procedure."

## *Fisheries of the Pacific Coast States, 1937*

### SUMMARY OF CATCH

| Product | Washington | | Oregon | |
|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* |
| Fish | 143,928,900 | $6,147,971 | 64,257,300 | $2,200,760 |
| Shellfish, etc | 11,876,100 | 1,074,376 | 4,687,600 | 408,479 |
| Total | 155,805,000 | 7,222,347 | 68,944,900 | 2,609,239 |

| Product | California | | Total | |
|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* |
| Fish | 1,345,570,600 | $18,374,105 | 1,553,756,800 | $26,722,836 |
| Shellfish, etc | 5,418,800 | 529,471 | 21,982,500 | 2,012,326 |
| Whale products | 1,138,100 | 41,223 | 1,138,100 | 41,223 |
| Total | 1,352,127,500 | 18,944,799 | 1,576,877,400 | 28,776,385 |

### OPERATING UNITS: BY STATES

| Item | Washington | | | | Oregon | | |
|---|---|---|---|---|---|---|---|
| | Puget Sound district | Coastal district | Columbia River district | Total | Columbia River district | Coastal district | Total |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 3,367 | 81 | 25 | 3,473 | 129 | 49 | 178 |
| On boats and shore | 1,852 | 3,794 | 888 | 6,534 | 2,036 | 1,228 | 3,264 |
| Total | 5,219 | 3,875 | 913 | 10,007 | 2,165 | 1,277 | 3,442 |
| Vessels: | | | | | | | |
| Steam, 21 to 30 tons | 1 | -------- | -------- | 1 | -------- | -------- | -------- |
| Net tonnage | 23 | -------- | -------- | 23 | -------- | -------- | -------- |
| Motor: | | | | | | | |
| 5 to 10 tons | 161 | 38 | 7 | 206 | 37 | 12 | 49 |
| 11 to 20 tons | 142 | 3 | 3 | 148 | 10 | 4 | 14 |
| 21 to 30 tons | 134 | -------- | 1 | 135 | -------- | -------- | -------- |
| 31 to 40 tons | 44 | -------- | -------- | 44 | -------- | -------- | -------- |
| 41 to 50 tons | 31 | -------- | -------- | 31 | -------- | -------- | -------- |
| 51 to 60 tons | 11 | -------- | -------- | 11 | -------- | -------- | -------- |
| 61 to 70 tons | 12 | -------- | -------- | 12 | 1 | -------- | 1 |
| 101 to 110 tons | -------- | -------- | -------- | -------- | 1 | 1 | 2 |
| Total | 535 | 41 | 11 | 587 | 49 | 17 | 66 |
| Net tonnage | 10,970 | 293 | 113 | 11,376 | 578 | 261 | 839 |
| Sail: | | | | | | | |
| 391 to 400 tons | 1 | -------- | -------- | 1 | -------- | -------- | -------- |
| 411 to 420 tons | 1 | -------- | -------- | 1 | -------- | -------- | -------- |
| 561 to 570 tons | 1 | -------- | -------- | 1 | -------- | -------- | -------- |
| Total | 3 | -------- | -------- | 3 | -------- | -------- | -------- |
| Net tonnage | 1,374 | -------- | -------- | 1,374 | -------- | -------- | -------- |
| Total vessels | 539 | 41 | 11 | 591 | 49 | 17 | 66 |
| Total net tonnage | 12,367 | 293 | 113 | 12,773 | 578 | 261 | 839 |
| Boats: | | | | | | | |
| Motor | 826 | 481 | 619 | 1,926 | 910 | 835 | 1,745 |
| Other | 271 | 207 | 22 | 500 | 80 | 110 | 190 |
| Accessory boats | 275 | -------- | -------- | 275 | 2 | 1 | 3 |
| Apparatus: | | | | | | | |
| Purse seines: | | | | | | | |
| Herring | 4 | -------- | -------- | 4 | -------- | -------- | -------- |
| Length, yards | 468 | -------- | -------- | 468 | -------- | -------- | -------- |
| Salmon | 212 | -------- | -------- | 212 | -------- | -------- | -------- |
| Length, yards | 115,500 | -------- | -------- | 115,500 | -------- | -------- | -------- |
| Sardine [1] | 17 | -------- | -------- | 17 | 2 | 1 | 3 |
| Length, yards | 7,240 | -------- | -------- | 7,240 | 885 | 500 | 1,385 |
| Haul seines | 170 | 4 | 1 | 175 | 44 | 4 | 48 |
| Length, yards | 12,392 | 280 | 167 | 12,839 | 23,072 | 666 | 23,738 |

[1] Used in the pilchard fishery of the Washington and Oregon coasts by Puget Sound purse seine vessels. See separate sections for catch statistics.

*Fisheries of the Pacific Coast States, 1937*—Continued

OPERATING UNITS: BY STATES—Continued

| Item | Washington | | | | Oregon | | |
|---|---|---|---|---|---|---|---|
| | Puget Sound district | Coastal district | Columbia River district | Total | Columbia River district | Coastal district | Total |
| Apparatus—Continued. | | | | | | | |
| Gill nets: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Drift | 416 | 184 | 471 | 1,071 | 703 | 410 | 1,113 |
| Square yards | 628,160 | 354,752 | 1,303,728 | 2,286,640 | 2,240,082 | 577,690 | 2,817,772 |
| Set | [2] 4 | [2] 125 | | [2] 129 | 137 | 903 | 1,040 |
| Square yards | 960 | 27,600 | | 28,560 | 38,360 | 321,480 | 359,840 |
| Lines: | | | | | | | |
| Trawl, set, and hand | 26,418 | | 349 | 26,767 | 706 | 160 | 866 |
| Hooks | 546,786 | | 17,680 | 564,466 | 18,940 | 2,880 | 21,820 |
| Troll | 1,360 | 650 | 195 | 2,205 | 808 | 415 | 1,223 |
| Hooks | 6,010 | 2,925 | 862 | 9,797 | 3,426 | 1,840 | 5,266 |
| Pound nets | [2] 2 | | | [2] 2 | 27 | | 27 |
| Brush weirs | 4 | | | 4 | | | |
| Dip nets | 23 | 60 | 222 | 305 | 163 | | 163 |
| Reef nets | 37 | | | 37 | | | |
| Beam trawls | 10 | | | 10 | | | |
| Yards at mouth | 66 | | | 66 | | | |
| Otter trawls | 43 | | | 43 | 2 | 2 | 4 |
| Yards at mouth | 645 | | | 645 | 40 | 40 | 80 |
| Traps: | | | | | | | |
| Crab | 2,541 | 2,863 | | 5,404 | | 16,835 | 16,835 |
| Crawfish | | | | | 1,125 | | 1,125 |
| Octopus | 247 | | | 247 | | | |
| Dredges, oyster | | 4 | | 4 | | | |
| Yards at mouth | | 8 | | 8 | | | |
| Tongs and rakes, oyster | 120 | 230 | | 350 | | 18 | 18 |
| Shovels | 467 | 3,023 | | 3,490 | | 177 | 177 |

| Item | California | | | | | | Grand total |
|---|---|---|---|---|---|---|---|
| | Northern district | San Francisco district | Monterey district | San Pedro district | San Diego district | Total | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 31 | 1,293 | 729 | 2,336 | 1,059 | 5,448 | 9,099 |
| On boats and shore | 263 | 850 | 458 | 838 | 249 | 2,658 | 12,456 |
| Total | 294 | 2,143 | 1,187 | 3,174 | 1,308 | 8,106 | 21,555 |
| Vessels: | | | | | | | |
| Steam: | | | | | | | |
| 11 to 20 tons | | 1 | | | | 1 | 1 |
| 21 to 30 tons | | 1 | | | | 1 | 2 |
| 31 to 40 tons | | 1 | | | | 1 | 1 |
| Total | | 3 | | | | 3 | 4 |
| Net tonnage | | 73 | | | | 73 | 96 |
| Motor: | | | | | | | |
| 5 to 10 tons | 17 | 16 | 19 | 45 | 30 | 127 | 382 |
| 11 to 20 tons | | 19 | 1 | 23 | 16 | 59 | 221 |
| 21 to 30 tons | | 5 | 1 | 43 | 5 | 54 | 189 |
| 31 to 40 tons | | 28 | 2 | 35 | 8 | 73 | 117 |
| 41 to 50 tons | | 17 | 9 | 16 | 3 | 45 | 76 |
| 51 to 60 tons | | 12 | 19 | 39 | 2 | 72 | 83 |
| 61 to 70 tons | | 17 | 9 | 15 | 1 | 42 | 55 |
| 71 to 80 tons | | 6 | 9 | 7 | 7 | 29 | 29 |
| 81 to 90 tons | | 3 | 1 | 1 | 4 | 9 | 9 |
| 91 to 100 tons | | 2 | | 3 | 2 | 7 | 7 |
| 101 to 110 tons | | | | | 2 | 2 | 4 |
| 111 to 120 tons | | | | 4 | 5 | 9 | 9 |
| 121 to 130 tons | | | | 1 | 4 | 5 | 5 |
| 131 to 140 tons | | | | 1 | 7 | 8 | 8 |
| 141 to 150 tons | | | | 1 | 2 | 3 | 3 |
| 151 to 160 tons | | | | | 2 | 2 | 2 |
| 161 to 170 tons | | | | 1 | 1 | 2 | 2 |

[2] Operated on Indian reservations.

*Fisheries of the Pacific Coast States, 1937*—Continued

OPERATING UNITS: BY STATES—Continued

| Item | California | | | | | | Grand total |
|---|---|---|---|---|---|---|---|
| | Northern district | San Francisco district | Monterey district | San Pedro district | San Diego district | Total | |
| Vessels—Continued. | | | | | | | |
| Motor—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| 171 to 180 tons | | | | 1 | 1 | 2 | 2 |
| 181 to 190 tons | | | | 1 | 2 | 3 | 3 |
| 191 to 200 tons | | | | | 3 | 3 | 3 |
| 201 to 210 tons | | | | 2 | | 2 | 2 |
| 291 to 300 tons | | | | | 1 | 1 | 1 |
| 361 to 370 tons | | | | 1 | | 1 | 1 |
| Total | 17 | 125 | 70 | 240 | 108 | 560 | 1,213 |
| Net tonnage | 127 | 5,029 | 3,055 | 9,950 | 6,674 | 24,835 | 37,050 |
| Sail: | | | | | | | |
| 321 to 330 tons | | 1 | | | | 1 | 1 |
| 391 to 400 tons | | | | | | | 1 |
| 411 to 420 tons | | | | | | | 1 |
| 491 to 500 tons | | 1 | | | | 1 | 1 |
| 561 to 570 tons | | | | | | | 1 |
| Total | | 2 | | | | 2 | 5 |
| Net tonnage | | 824 | | | | 824 | 2,198 |
| Total vessels | 17 | 130 | 70 | 240 | 108 | 565 | 1,222 |
| Total net tonnage | 127 | 5,926 | 3,055 | 9,950 | 6,674 | 25,732 | 39,344 |
| Boats: | | | | | | | |
| Motor | 203 | 521 | 209 | 432 | 121 | 1,486 | 5,157 |
| Other | 3 | 47 | 24 | 45 | 2 | 121 | 811 |
| Accessory boats | | 176 | 61 | 232 | 106 | 575 | 853 |
| Apparatus: | | | | | | | |
| Purse seines: | | | | | | | |
| Herring | | | | | | | 4 |
| Length, yards | | | | | | | 468 |
| Mackerel | | | 2 | 12 | | 14 | 14 |
| Length, yards | | | 1,200 | 5,537 | | 6,737 | 6,737 |
| Salmon | | | | | | | 212 |
| Length, yards | | | | | | | 115,500 |
| Sardine or pilchard | | 89 | 50 | 107 | | 246 | 266 |
| Length, yards | | 34,052 | 18,385 | 41,457 | | 93,894 | 102,519 |
| Tuna | | 7 | 11 | 84 | | 102 | 102 |
| Length, yards | | 4,100 | 6,352 | 49,783 | | 60,235 | 60,235 |
| Lampara and ring nets: | | | | | | | |
| Mackerel | | 1 | 1 | 56 | 9 | 67 | 67 |
| Length, yards | | 400 | 440 | 28,438 | 3,150 | 32,428 | 32,428 |
| Sardine or pilchard | | 15 | 24 | 77 | 18 | 134 | 134 |
| Length, yards | | 4,425 | 6,487 | 37,768 | 4,421 | 53,101 | 53,101 |
| Other | | | 17 | 13 | 2 | 32 | 32 |
| Length, yards | | | 3,230 | 6,162 | 1,000 | 10,392 | 10,392 |
| Haul seines | | 4 | | | | 4 | 227 |
| Length yards | | 580 | | | | 580 | 37,157 |
| Gill nets: | | | | | | | |
| Drift: | | | | | | | |
| Barracuda | | | | 5 | 5 | 10 | 10 |
| Square yards | | | | 45,000 | 15,000 | 60,000 | 60,000 |
| Salmon | | 115 | | | | 115 | 2,299 |
| Square yards | | 362,250 | | | | 362,250 | 5,466,662 |
| Sea bass | | 7 | 12 | | | 19 | 19 |
| Square yards | | 12,460 | 24,000 | | | 36,460 | 36,460 |
| Shad | | 125 | | | | 125 | 125 |
| Square yards | | 437,000 | | | | 437,000 | 437,000 |
| Set: | | | | | | | |
| "California halibut" | | | 14 | | | 14 | 14 |
| Square yards | | | 33,796 | | | 33,796 | 33,796 |
| Crab | | | 10 | | | 10 | 10 |
| Square yards | | | 33,600 | | | 33,600 | 33,600 |
| Salmon | | | | | | | 1,169 |
| Square yards | | | | | | | 388,400 |
| Sea bass | | | | 13 | 9 | 22 | 22 |
| Square yards | | | | 41,600 | 43,942 | 85,542 | 85,542 |
| Miscellaneous | 17 | 46 | 33 | 21 | 4 | 121 | 121 |
| Square yards | 12,750 | 56,174 | 43,915 | 18,700 | 6,080 | 137,619 | 137,619 |
| Trammel nets | | | | 22 | 9 | 31 | 31 |
| Square yards | | | | 93,432 | 86,665 | 180,097 | 180,097 |

## *Fisheries of the Pacific Coast States, 1937*—Continued

### OPERATING UNITS: BY STATES—Continued

| Item | California | | | | | | Grand total |
|---|---|---|---|---|---|---|---|
| | Northern district | San Francisco district | Monterey district | San Pedro district | San Diego district | Total | |
| Apparatus—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Lines: | | | | | | | |
| Trawl, set, and hand | 299 | 759 | 766 | 1, 946 | 1, 289 | 5, 059 | 32, 692 |
| Hooks | 39, 978 | 38, 095 | 80, 268 | 288, 041 | 36, 903 | 483, 285 | 1, 069, 571 |
| Troll | 1, 083 | 1, 266 | 1, 500 | 1, 580 | 560 | 5, 989 | 9, 417 |
| Hooks | 4, 723 | 4, 484 | 3, 846 | 1, 612 | 560 | 15, 225 | 30, 288 |
| Pound nets | | | | | | | 29 |
| Brush weirs | | | | | | | 4 |
| Fyke nets | | 1, 989 | | | | 1, 989 | 1, 989 |
| Dip nets | 24 | 3 | | | | 27 | 495 |
| Bag nets, shrimp | | 9 | | | | 9 | 9 |
| Length, yards | | 6, 656 | | | | 6, 656 | 6, 656 |
| Reef nets | | | | | | | 37 |
| Paranzella nets | | 10 | | 4 | | 14 | 14 |
| Yards at mouth | | 167 | | 67 | | 234 | 234 |
| Beam trawls | | 15 | | | | 15 | 25 |
| Yards at mouth | | 100 | | | | 100 | 166 |
| Otter trawls | | | 7 | | | 7 | 54 |
| Yards at mouth | | | 78 | | | 78 | 803 |
| Traps: | | | | | | | |
| Crab | 703 | 5, 095 | | | | 5, 798 | 28, 037 |
| Crawfish | | | | | | | 1, 125 |
| Octopus | | | 100 | | | 100 | 347 |
| Sea crawfish | | | | 4, 940 | 781 | 5, 721 | 5, 721 |
| Harpoons: | | | | | | | |
| Swordfish | | | | 52 | 15 | 67 | 67 |
| Whales | | 2 | | | | 2 | 2 |
| Dredges, oyster | | | | | | | 4 |
| Yards at mouth | | | | | | | 8 |
| Tongs and rakes, oyster | 3 | 41 | 4 | | | 48 | 416 |
| Shovels | 13 | 81 | 26 | 63 | | 183 | 3, 850 |
| Abalone outfits | | | 14 | 10 | | 24 | 24 |

### CATCH: BY STATES

| Species | Washington | | Oregon | | California[1] | | Total | |
|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Anchovies | | | | | 226, 200 | $3, 239 | 226, 200 | $3, 239 |
| Barracuda | | | | | 2, 933, 000 | 160, 520 | 2, 933, 000 | 160, 520 |
| Cabrilla | | | | | 131, 200 | 6, 918 | 131, 200 | 6, 918 |
| Carp | 126, 700 | $3, 458 | | | 36, 400 | 1, 418 | 163, 100 | 4, 876 |
| Catfish | | | | | 302, 900 | 34, 437 | 302, 900 | 34, 437 |
| Cod[2] | 7, 893, 500 | 114, 705 | 12, 700 | $190 | 4, 731, 400 | 80, 671 | 12, 637, 600 | 195, 566 |
| Flounders: | | | | | | | | |
| "California halibut" | | | | | 1, 206, 900 | 102, 234 | 1, 206, 900 | 102, 234 |
| "Sole" | 3, 773, 900 | 104, 526 | 650, 400 | 11, 849 | 8, 302, 200 | 457, 614 | 12, 726, 500 | 573, 989 |
| Other | 523, 200 | 13, 144 | 261, 500 | 2, 750 | 1, 566, 900 | 56, 506 | 2, 351, 600 | 72, 400 |
| Flyingfish | | | | | 41, 900 | 1, 834 | 41, 900 | 1, 834 |
| Grayfish | 1, 620, 100 | 14, 360 | | | 913, 100 | 15, 009 | 2, 533, 200 | 29, 369 |
| Groupers | | | | | 57, 900 | 2, 886 | 57, 900 | 2, 886 |
| Hake | | | | | 63, 400 | 668 | 63, 400 | 668 |
| Halibut | 23, 733, 600 | 2, 118, 668 | 367, 200 | 31, 670 | 316, 900 | 26, 507 | 24, 417, 700 | 2, 176, 845 |
| Hardhead | | | | | 54, 200 | 4, 894 | 54, 200 | 4, 894 |
| Herring | 1, 130, 800 | 12, 066 | 30, 000 | 402 | 631, 300 | 4, 777 | 1, 792, 100 | 17, 245 |
| Horse mackerel | | | | | 6, 541, 600 | 64, 803 | 6, 541, 600 | 64, 803 |
| Kingfish | | | | | 645, 600 | 15, 683 | 645, 600 | 15, 683 |
| "Lingcod" | 1, 611, 000 | 54, 723 | 151, 700 | 5, 090 | 968, 300 | 41, 287 | 2, 731, 000 | 101, 100 |
| Mackerel | | | | | 60, 936, 400 | 669, 377 | 60, 936, 400 | 669, 377 |
| Marlin | | | | | 4, 100 | 182 | 4, 100 | 182 |
| Mullet | | | | | 8, 500 | 731 | 8, 500 | 731 |

[1] Includes the catch taken off Latin America.

[2] All of the cod reported for California and most of the Washington catch were taken off Alaska.

NOTE.—In addition to the California operating units shown above, 47 motor vessels, 43 accessory boats, and 7 motorboats having their home ports in the State of Washington, and 19 motor vessels, 19 accessory boats, and 21 motorboats having their home ports in the State of Oregon, were operated off California and contributed to the California catch. The following gear was operated by these craft: 45 sardine purse seines, 1 tuna purse seine, 3 sardine ring nets, 6 set and hand lines, and 282 troll lines.

*Fisheries of the Pacific Coast States, 1937*—Continued

CATCH: BY STATES—Continued

| Species | Washington | | Oregon | | California | | Total | |
|---|---|---|---|---|---|---|---|---|
| FISH—contd. | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Perch | 122,500 | $4,471 | 600 | $12 | 213,400 | $9,382 | 336,500 | $13,865 |
| Pilchard or sardine | 34,429,100 | 224,093 | 33,462,500 | 217,506 | 1,071,613,400 | 6,373,234 | 1,139,505,000 | 6,814,833 |
| Pompano | | | | | 5,100 | 2,434 | 5,100 | 2,434 |
| Rock bass | | | | | 324,300 | 18,024 | 324,300 | 18,024 |
| Rockfishes | 444,600 | 19,437 | 153,800 | 4,459 | 4,290,900 | 189,484 | 4,889,300 | 213,380 |
| Rudderfish | | | | | 36,100 | 1,783 | 36,100 | 1,783 |
| Sablefish | 3,067,500 | 155,210 | 147,700 | 6,591 | 733,600 | 29,428 | 3,948,800 | 191,229 |
| Salmon: | | | | | | | | |
| Blueback, red, or sockeye | 6,794,700 | 702,742 | 247,000 | 34,580 | | | 7,041,700 | 737,322 |
| Chinook or king | 12,624,600 | 1,067,991 | 16,059,000 | 1,270,126 | 6,907,800 | 528,993 | 35,591,400 | 2,867,110 |
| Chum or keta | 9,855,900 | 268,049 | 1,579,100 | 26,291 | | | 11,435,000 | 294,340 |
| Humpback or pink | 25,424,500 | 637,123 | 400 | 12 | | | 25,424,900 | 637,135 |
| Silver or coho | 8,952,000 | 522,599 | 7,215,800 | 368,690 | | | 16,167,800 | 891,289 |
| Sculpin | | | | | 145,500 | 11,002 | 145,500 | 11,002 |
| Sea bass: | | | | | | | | |
| Black | | | | | 714,200 | 39,749 | 714,200 | 39,749 |
| White | | | | | 602,300 | 56,810 | 602,300 | 56,810 |
| Shad | 37,600 | 978 | 524,600 | 16,184 | 651,000 | 29,156 | 1,213,200 | 46,318 |
| Sheepshead | | | | | 81,400 | 2,998 | 81,400 | 2,998 |
| Skates | | | | | 447,500 | 8,511 | 447,500 | 8,511 |
| Smelts: | | | | | | | | |
| Eulachon | 562,100 | 37,590 | 472,800 | 33,096 | | | 1,034,900 | 70,686 |
| Other | 367,700 | 21,980 | | | 682,000 | 29,041 | 1,049,700 | 51,021 |
| Spanish mackerel | | | | | 26,700 | 1,351 | 26,700 | 1,351 |
| Splittail | | | | | 10,800 | 371 | 10,800 | 371 |
| Squawfish | | | | | 500 | 23 | 500 | 23 |
| Steelhead trout | 339,900 | 20,810 | 1,725,100 | 101,369 | | | 2,065,000 | 122,179 |
| Striped bass | | | 34,100 | 1,855 | | | 34,100 | 1,855 |
| Sturgeon | 72,800 | 3,398 | 81,900 | 1,892 | | | 154,700 | 5,290 |
| Suckers | | | | | 7,900 | 219 | 7,900 | 219 |
| Swordfish | | | | | 625,300 | 85,006 | 625,300 | 85,006 |
| Tomcod | | | | | 1,100 | 35 | 1,100 | 35 |
| Tuna and tunalike fishes: | | | | | | | | |
| Albacore | 420,600 | 25,850 | 1,079,400 | 66,146 | 2,020,000 | 194,828 | 3,520,000 | 286,824 |
| Bluefin | | | | | 12,693,900 | 724,913 | 12,693,900 | 724,913 |
| Bonito | | | | | 7,808,000 | 286,282 | 7,808,000 | 286,282 |
| Skipjack or striped tuna | | | | | 47,104,100 | 2,318,523 | 47,104,100 | 2,318,523 |
| Yellowfin | | | | | 91,522,500 | 5,457,819 | 91,522,500 | 5,457,819 |
| Whitebait | | | | | 86,100 | 4,665 | 86,100 | 4,665 |
| Whitefish | | | | | 57,100 | 3,032 | 57,100 | 3,032 |
| Yellowtail | | | | | 5,371,000 | 212,008 | 5,371,000 | 212,008 |
| Other fish | | | | | 166,800 | 2,806 | 166,800 | 2,806 |
| Total | 143,928,900 | 6,147,971 | 64,257,300 | 2,200,760 | 1,345,570,600 | 18,374,105 | 1,553,756,800 | 26,722,836 |
| SHELLFISH, ETC. | | | | | | | | |
| Crabs | 2,359,800 | 174,816 | 4,372,000 | 367,248 | 1,624,200 | 179,035 | 8,356,000 | 721,099 |
| Crawfish, fresh-water | | | 84,200 | 9,262 | | | 84,200 | 9,262 |
| Sea crawfish or spiny lobster | | | | | 1,322,400 | 163,659 | 1,322,400 | 153,659 |
| Shrimp | 46,900 | 6,604 | | | 1,111,700 | 16,915 | 1,158,600 | 23,519 |
| Abalone | | | | | 572,600 | 92,654 | 572,600 | 92,654 |
| Clams: | | | | | | | | |
| Hard | 966,100 | 66,994 | | | 13,200 | 2,780 | 979,300 | 69,774 |
| Pismo | | | | | 56,000 | 10,833 | 56,000 | 10,833 |
| Razor | 424,200 | 79,843 | 56,500 | 13,447 | | | 480,700 | 93,290 |
| Soft | | | | | 29,700 | 7,891 | 29,700 | 7,891 |
| Mixed | | | 77,800 | 6,682 | | | 77,800 | 6,682 |
| Mussels | | | | | 200 | 17 | 200 | 17 |
| Octopus | 64,200 | 2,504 | | | 23,900 | 1,890 | 88,100 | 4,394 |
| Oysters, market: | | | | | | | | |
| Eastern | 800 | 300 | | | 67,300 | 23,047 | 68,100 | 23,347 |
| Japanese | 7,712,700 | 543,041 | 87,500 | 5,400 | 90,700 | 13,602 | 7,890,900 | 562,043 |
| Native | 266,000 | 193,950 | 9,600 | 6,440 | 5,300 | 1,768 | 280,900 | 202,158 |
| Scallops, bay | 24,100 | 5,745 | | | | | 24,100 | 5,745 |

## *Fisheries of the Pacific Coast States, 1937*—Continued

### CATCH: BY STATES—Continued

| Species | Washington | | Oregon | | California | | Total | |
|---|---|---|---|---|---|---|---|---|
| SHELLFISH, ETC.—con. | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Squid | 1,300 | $79 | ---------- | ---------- | 501,600 | $15,380 | 502,900 | $15,459 |
| Trepang | 10,000 | 500 | ---------- | ---------- | ---------- | ---------- | 10,000 | 500 |
| Total | 11,876,100 | 1,074,376 | 4,687,600 | $408,479 | 5,418,800 | 529,471 | 21,982,500 | 2,012,326 |
| WHALE PRODUCTS | | | | | | | | |
| Whale meat | ---------- | ---------- | ---------- | ---------- | 624,900 | 12,207 | 624,900 | 12,207 |
| Whale oil | ---------- | ---------- | ---------- | ---------- | 513,200 | 29,016 | 513,200 | 29,016 |
| Total | ---------- | ---------- | ---------- | ---------- | 1,138,100 | 41,223 | 1,138,100 | 41,223 |
| Grand total | 155,805,000 | 7,222,347 | 68,944,900 | 2,609,239 | 1,352,127,500 | 18,944,799 | 1,576,877,400 | 28,776,385 |

## *Industries related to the fisheries of the Pacific Coast States, 1937*

### OPERATING UNITS, SALARIES, AND WAGES

| Item | Washington | Oregon | California | Total |
|---|---|---|---|---|
| Transporting: | *Number* | *Number* | *Number* | *Number* |
| Persons engaged | 144 | 42 | 24 | 210 |
| Vessels, motor | 52 | 21 | 3 | 76 |
| Net tonnage | 1,297 | 266 | 161 | 1,724 |
| Wholesale and manufacturing: | | | | |
| Establishments | 113 | 48 | 169 | 330 |
| Persons engaged: | | | | |
| Proprietors | 63 | 39 | 275 | 377 |
| Salaried employees | 246 | 90 | 818 | 1,154 |
| Wage earners: | | | | |
| Average for season | 3,046 | 1,149 | 14,066 | 18,261 |
| Average for year | 1,305 | 551 | 5,133 | 6,989 |
| Paid to salaried employees | $591,984 | $188,075 | $2,478,881 | $3,258,940 |
| Paid to wage earners | $1,454,320 | $555,729 | $5,400,420 | $7,410,469 |
| Total salaries and wages | $2,046,304 | $743,804 | $7,879,301 | $10,669,409 |
| Fishermen manufacturing | 59 | 18 | 75 | 152 |

### PRODUCTS MANUFACTURED

| Item | Washington | | Oregon | | California | |
|---|---|---|---|---|---|---|
| By manufacturing firms: | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Barracuda, fresh fillets ..pounds | ---------- | ---------- | ---------- | ---------- | 650,000 | $97,500 |
| Cabrilla, fresh fillets ..do | ---------- | ---------- | ---------- | ---------- | 55,000 | 8,450 |
| Cod: | | | | | | |
| Salted: | | | | | | |
| Dry ..do | 470,925 | $38,876 | ---------- | ---------- | ---------- | ---------- |
| Boneless and absolutely boneless ..pounds | 917,047 | 138,966 | ---------- | ---------- | (1) | (1) |
| Fresh fillets ..do | 41,623 | 4,281 | ---------- | ---------- | ---------- | ---------- |
| Flounders: | | | | | | |
| Fresh fillets ..do | 848,659 | 110,405 | (1) | (1) | 1,825,000 | 352,500 |
| Frozen fillets ..do | 144,335 | 18,763 | (1) | (1) | ---------- | ---------- |
| Grayfish, fresh fillets ..do | ---------- | ---------- | ---------- | ---------- | 25,000 | 3,125 |
| Halibut, frozen steaks ..do | 109,755 | 17,476 | ---------- | ---------- | ---------- | ---------- |
| Lingcod, fresh fillets ..do | 121,130 | 12,372 | (1) | (1) | 75,000 | 11,250 |
| Mackerel: | | | | | | |
| Canned ..standard cases | ---------- | ---------- | ---------- | ---------- | 839,450 | 2,657,370 |
| Meal ..tons | ---------- | ---------- | ---------- | ---------- | 2,194 | 77,827 |
| Oil ..gallons | ---------- | ---------- | ---------- | ---------- | 80,811 | 30,812 |
| Pilchard: | | | | | | |
| Canned ..standard cases | ---------- | ---------- | ---------- | ---------- | 2,812,456 | 8,592,117 |
| Meal ..tons | 2,871 | 104,762 | 2,822 | $102,966 | 83,729 | 3,117,554 |
| Oil ..gallons | 824,332 | 319,344 | 689,393 | 281,155 | 14,479,491 | 5,603,117 |
| Rockfishes, fresh fillets ..pounds | (1) | (1) | (1) | (1) | 1,050,000 | 157,500 |

See footnotes at end of table.

*Industries related to the fisheries of the Pacific Coast States, 1937*—Continued

PRODUCTS MANUFACTURED—Continued

| Item | Washington | | Oregon | | California | |
|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing firms—Contd. | | | | | | |
| Sablefish: | | | | | | |
| Fresh steaks ........ pounds | -------- | -------- | -------- | -------- | 25,000 | $3,750 |
| Kippered ........ do | 290,052 | $49,827 | -------- | -------- | 206,016 | 41,203 |
| Salted ........ do | 202,275 | 12,505 | (1) | (1) | -------- | -------- |
| Salmon: | | | | | | |
| Frozen steaks ........ do | 25,355 | 3,999 | (1) | (1) | -------- | -------- |
| Salted: | | | | | | |
| Mild-cured [2] ........ do | 2,596,500 | 524,405 | 466,675 | $107,923 | 830,400 | 166,196 |
| Eggs for caviar ........ do | 274,000 | 29,740 | -------- | -------- | -------- | -------- |
| Kippered ........ do | 1,190,761 | 211,942 | (1) | (1) | -------- | -------- |
| Smoked ........ do | 213,143 | 60,582 | 159,321 | 52,828 | 225,277 | 97,573 |
| Canned: | | | | | | |
| Blueblack, red, or sockeye ........ standard cases | 65,184 | 1,073,911 | 5,071 | 88,209 | -------- | -------- |
| Chinook or king ........ do | 87,322 | 1,083,480 | 213,690 | 2,999,670 | -------- | -------- |
| Chum or keta ........ do | 34,525 | 151,159 | 31,472 | 133,204 | -------- | -------- |
| Humpback or pink ........ do | 328,790 | 1,590,266 | -------- | -------- | -------- | -------- |
| Silver or coho ........ do | 38,957 | 399,045 | 63,672 | 676,765 | -------- | -------- |
| Steelhead trout ........ do | 3,523 | 35,276 | 13,166 | 155,180 | -------- | -------- |
| Eggs for bait ........ do | 4,896 | 72,550 | (1) | (1) | -------- | -------- |
| Oil ........ gallons | (1) | (1) | [3] 33,165 | [3] 51,686 | -------- | -------- |
| Sea bass: | | | | | | |
| Black, fresh steaks ........ pounds | -------- | -------- | -------- | -------- | 250,000 | 40,000 |
| White, fresh fillets ........ do | -------- | -------- | -------- | -------- | 175,000 | 41,000 |
| Shad: | | | | | | |
| Canned ........ standard cases | 1,214 | 4,128 | 2,160 | 7,361 | 5,845 | 19,065 |
| Roe, canned ........ do | (1) | (1) | 633 | 13,926 | 1,189 | 34,424 |
| Sheephead, fresh fillets ........ pounds | -------- | -------- | -------- | -------- | 25,000 | 3,750 |
| Swordfish, fresh steaks ........ do | -------- | -------- | -------- | -------- | 100,000 | 25,000 |
| Totuava, fresh steaks ........ do | -------- | -------- | -------- | -------- | 515,000 | 93,000 |
| Tuna and tunalike fishes: | | | | | | |
| Canned: | | | | | | |
| Albacore ........ standard cases | (1) | (1) | (1) | (1) | 104,683 | 726,532 |
| Bluefin ........ do | -------- | -------- | -------- | -------- | 211,886 | 1,197,421 |
| Bonito ........ do | -------- | -------- | -------- | -------- | 152,175 | 771,498 |
| Striped ........ do | -------- | -------- | -------- | -------- | 695,007 | 3,917,454 |
| "Tonno" ........ do | -------- | -------- | -------- | -------- | 252,857 | 1,915,779 |
| Yellowfin ........ do | -------- | -------- | -------- | -------- | 1,649,776 | 10,038,641 |
| Yellowtail ........ do | -------- | -------- | -------- | -------- | 62,974 | 309,692 |
| Meal ........ tons | -------- | -------- | -------- | -------- | 10,872 | 378,531 |
| Oil ........ gallons | -------- | -------- | -------- | -------- | 141,963 | 30,702 |
| Crabs: | | | | | | |
| Canned ........ standard cases | -------- | -------- | 499 | 14,886 | -------- | -------- |
| Meat, packaged, fresh-cooked ........ pounds | 103,149 | 38,186 | 536,579 | 206,698 | -------- | -------- |
| Abalone, steaks ........ do | -------- | -------- | -------- | -------- | 541,000 | 165,154 |
| Clams, hard: | | | | | | |
| Fresh-shucked ........ gallons | 3,559 | 4,535 | (1) | (1) | -------- | -------- |
| Canned: | | | | | | |
| Whole ........ standard cases | 25,339 | 108,785 | -------- | -------- | -------- | -------- |
| Minced ........ do | 22,397 | 106,443 | -------- | -------- | -------- | -------- |
| Juice ........ do | 5,305 | 11,565 | -------- | -------- | -------- | -------- |
| Shells, crushed for poultry feed ........ tons | 1,050 | 9,100 | -------- | -------- | -------- | -------- |
| Clams, razor: | | | | | | |
| Canned: | | | | | | |
| Whole ........ standard cases | 1,246 | 10,466 | (1) | (1) | -------- | -------- |
| Minced ........ do | 14,334 | 120,767 | 1,288 | 10,718 | -------- | -------- |
| Oysters: | | | | | | |
| Japanese: | | | | | | |
| Fresh-shucked ........ gallons | 299,738 | 360,697 | 45,174 | 52,174 | (1) | (1) |
| Canned ........ standard cases | 109,192 | 462,049 | (1) | (1) | -------- | -------- |
| Native, fresh-shucked ........ gallons | 19,401 | 154,970 | 6,598 | 51,287 | (1) | (1) |
| Shell products: | | | | | | |
| Poultry feed ........ tons | 6,065 | 53,455 | (1) | (1) | 14,402 | 67,533 |
| Lime ........ do | 2,609 | 15,535 | (1) | (1) | 1,505 | 6,377 |
| Shrimp, bran and meal ........ do | -------- | -------- | -------- | -------- | 71 | 1,810 |
| Unclassified: | | | | | | |
| Packaged ........ pounds | [4] 104,875 | [4] 18,465 | [5] 142,093 | [5] 30,158 | (6) | (6) |
| Salted ........ do | [7] 504,268 | [7] 39,073 | (6) | (6) | [8] 1,138,098 | [8] 147,310 |
| Smoked ........ do | (6) | (6) | (6) | (6) | [9] 63,650 | [9] 11,115 |
| Canned: | | | | | | |
| Cat and dog food ........ standard cases | -------- | -------- | -------- | -------- | 189,309 | 548,086 |
| Other ........ do | [10] 5,498 | [10] 47,038 | [11] 7,256 | [11] 63,762 | (6) | (6) |
| Meal ........ tons | [12] 1,139 | [12] 51,738 | (6) | (6) | [13] 1,340 | [13] 30,701 |
| Oil ........ gallons | [14] 152,899 | [14] 1,088,583 | -------- | -------- | [15] 76,123 | [15] 198,562 |
| Miscellaneous | -------- | [16] 11,682 | -------- | [17] 27,984 | -------- | [18] 501,572 |
| Total | -------- | 8,781,192 | -------- | 5,128,540 | -------- | 42,238,553 |

See footnotes at end of table.

*Industries related to the fisheries of the Pacific Coast States, 1937*—Continued

PRODUCTS MANUFACTURED—Continued

| Item | Washington | | Oregon | | California | |
|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By fishermen: | | | | | | |
| Cod, green salted [2] ... pounds | 2,310,240 | $106,325 | | | 1,466,700 | $80,671 |
| Cod tongues, salted ... do | 18,940 | 1,615 | | | | |
| Sablefish, salted ... do | 58,100 | 1,995 | | | | |
| Crab meat, packaged, fresh-cooked ... do | | | 3,200 | $1,120 | | |
| Shrimp: | | | | | | |
| Meat, packaged, fresh-cooked ... do | | | | | 55,934 | 7,831 |
| Bran ... tons | | | | | 47 | 1,410 |
| Clams, mixed, fresh-shucked ... gallons | | | 8,645 | 10,374 | | |
| Scallops, bay, fresh-shucked ... do | 998 | 2,220 | | | | |
| Total | | 112,155 | | 11,494 | | 89,912 |
| Grand total | | 8,893,347 | | 5,140,034 | | 42,328,465 |

[1] The production of this item has been included under "Unclassified products."

[2] This item is usually an intermediate product, and although included in the total, may be shown in its final stage of processing in this or another State.

[3] Includes the production of both edible and industrial salmon oils.

[4] Includes fresh fillets of rockfishes; frozen fillets of halibut and "lingcod"; and fresh-shucked bay scallops.

[5] Includes fresh fillets of flounders, "lingcod", and rockfishes; frozen fillets of flounders, "lingcod", and salmon; frozen salmon steaks; and fresh-shucked hard clams.

[6] The production of this item has been included under "miscellaneous."

[7] Includes green salted cod in process, partly boned, spiced herring, and salmon bellies.

[8] Includes salted barracuda, black sea bass, white sea bass, bonito, mackerel, pilchards, and yellowtail; pickled and spiced herring; green salted cod in process, partly boned; and boneless and absolutely boneless salted cod.

[9] Includes smoked chubs, herring, mackerel, and miscellaneous fish.

[10] Includes canned salted cod, shad roe, albacore tuna, fish paste, and hard clam chowder.

[11] Includes canned salmon eggs for bait, kippered sturgeon, albacore tuna, whole razor clams, razor clam juice, and Japanese oysters.

[12] Includes salmon, salmon egg, grayfish, and miscellaneous fish meals.

[13] Includes shark and miscellaneous fish meals, and miscellaneous green scrap.

[14] Includes salmon, grayfish, and miscellaneous fish oils; and halibut, "lingcod," sablefish, and tuna liver oils.

[15] Includes shark and whale oil; and shark and miscellaneous fish liver oils.

[16] Includes smoked herring bloaters, and kippered herring; kelp products; and clam-shell lime.

[17] Includes salted sablefish; smoked shad and sturgeon, and kippered salmon; salmon and salmon egg meals; oyster-shell poultry feed and lime; and marine-shell novelties.

[18] Includes fresh-shucked, eastern, Japanese, and native oysters; fresh-cooked shrimp meat; sun-dried shrimp; canned tuna roe and squid; liquid glue; kelp products; and marine-shell novelties.

NOTE.—The total value of manufactured products in the Pacific Coast States was as follows: By manufacturing establishments, $56,148,285; and by fishermen, $213,561. Some of the above products may have been imported from another State or foreign country; therefore, they cannot be correlated directly with the catch within the State. All of the persons engaged in the preparation of fishermen's manufactured products have also been included as fishermen.

## WASHINGTON

*Fisheries of Washington, 1937*

CATCH: BY DISTRICTS

| Species | Puget Sound district | | Coastal district | | Columbia River district | |
|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Carp | | | | | 126,700 | $3,458 |
| Cod [1] | 7,893,500 | $114,705 | | | | |
| Flounders: | | | | | | |
| "Sole" | 3,772,400 | 104,496 | 1,500 | $30 | | |
| Other | 493,000 | 12,818 | | | 30,200 | 326 |
| Grayfish | 1,620,100 | 14,360 | | | | |
| Halibut | 23,689,200 | 2,114,323 | 1,300 | 100 | 43,100 | 4,245 |
| Herring | 1,130,800 | 12,066 | | | | |
| "Lingcod" | 1,598,000 | 54,204 | 10,200 | 408 | 2,800 | 111 |
| Perch | 122,500 | 4,471 | | | | |
| Pilchard or sardine | 22,500 | 450 | 34,406,600 | 223,643 | | |
| Rockfishes | 428,000 | 18,943 | 300 | 6 | 16,300 | 488 |
| Sablefish | 2,862,800 | 146,070 | | | 204,700 | 9,140 |

[1] Nearly all of the cod were taken off Alaska.

## *Fisheries of Washington, 1937*—Continued

### CATCH: BY DISTRICTS—Continued

| Species | Puget Sound district | | Coastal district | | Columbia River district | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| FISH—continued | | | | | | |
| Salmon: | | | | | | |
| Blueback, red, or sockeye | 6,287,100 | $644,259 | 419,500 | $46,149 | 88,100 | $12,334 |
| Chinook or king | 5,572,100 | 486,169 | 1,925,400 | 173,801 | 5,127,100 | 408,021 |
| Chum or keta | 7,757,000 | 239,683 | 1,247,200 | 15,590 | 851,700 | 12,776 |
| Humpback or pink | 25,419,700 | 636,893 | 4,800 | 230 | | |
| Silver or coho | 6,432,600 | 371,148 | 1,614,300 | 101,930 | 905,100 | 49,521 |
| Shad | | | | | 37,600 | 978 |
| Smelt: | | | | | | |
| Eulachon | 10,200 | 760 | | | 551,900 | 36,830 |
| Surf or silver | 319,300 | 19,318 | 48,400 | 2,662 | | |
| Steelhead trout | | | 21,300 | 2,012 | 318,600 | 18,798 |
| Sturgeon | | | 41,200 | 2,678 | 31,600 | 720 |
| Tuna, albacore | 1,300 | 96 | 277,600 | 17,255 | 141,700 | 8,499 |
| Total | 95,432,100 | 4,995,232 | 40,019,600 | 586,494 | 8,477,200 | 566,245 |
| SHELLFISH, ETC. | | | | | | |
| Crabs | 484,100 | 24,760 | 1,875,700 | 150,056 | | |
| Shrimp | 46,900 | 6,604 | | | | |
| Clams: | | | | | | |
| Hard: | | | | | | |
| Butter | 471,800 | 25,275 | | | | |
| Little neck | 494,300 | 41,719 | | | | |
| Razor | | | 424,200 | 79,843 | | |
| Octopus | 64,200 | 2,504 | | | | |
| Oysters, market: | | | | | | |
| Eastern | | | 800 | 300 | | |
| Japanese | 630,700 | 47,302 | 7,082,000 | 495,739 | | |
| Native | 262,500 | 192,000 | 3,500 | 1,950 | | |
| Scallops, bay | 24,100 | 5,745 | | | | |
| Squid | 1,300 | 79 | | | | |
| Trepang | 10,000 | 500 | | | | |
| Total | 2,489,900 | 346,488 | 9,386,200 | 727,888 | | |
| Grand total | 97,922,000 | 5,341,720 | 49,405,800 | 1,314,382 | 8,477,200 | 566,245 |

## *Fisheries of the Puget Sound District of Washington, 1937*

### OPERATING UNITS: BY GEAR

| Item | Purse seines | | | Haul seines | Gill nets | | Lines | | Pound nets [2] | Brush weirs |
|---|---|---|---|---|---|---|---|---|---|---|
| | Salmon | Sardine[1] | Herring | | Drift | Set [2] | Trawl, set, and hand | Troll | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 1,671 | 193 | 14 | 40 | | | 1,204 | 278 | | |
| On boats and shore | 8 | | | 434 | 445 | 4 | 166 | 186 | 4 | 4 |
| Total | 1,679 | 193 | 14 | 474 | 445 | 4 | 1,370 | 464 | 4 | 4 |
| Vessels: | | | | | | | | | | |
| Motor: | | | | | | | | | | |
| 5 to 10 tons | 12 | | | 10 | | | 11 | 129 | | |
| 11 to 20 tons | 85 | | 1 | | | | 35 | 18 | | |
| 21 to 30 tons | 86 | | 3 | | | | 43 | 1 | | |
| 31 to 40 tons | 26 | 1 | | | | | 16 | | | |
| 41 to 50 tons | 1 | 3 | | | | | 28 | | | |
| 51 to 60 tons | | 5 | | | | | 7 | | | |
| 61 to 70 tons | | 8 | | | | | 4 | | | |
| Total | 210 | 17 | 4 | 10 | | | 144 | 148 | | |
| Net tonnage | 4,481 | 994 | 90 | 64 | | | 4,241 | 1,108 | | |

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[1] Operated in the Oregon and Washington coast pilchard fishery. See separate sections for catch statistics.

[2] Fished only on Indian reservations.

*Fisheries of the Puget Sound District of Washington, 1937*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Purse seines | | | Haul seines | Gill nets | | Lines | | Pound nets | Brush weirs |
|---|---|---|---|---|---|---|---|---|---|---|
| | Salmon | Sardine | Herring | | Drift | Set | Trawl, set, and hand | Troll | | |
| Vessels—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Sail: | | | | | | | | | | |
| 391 to 400 tons | | | | | | | 1 | | | |
| 411 to 420 tons | | | | | | | 1 | | | |
| 561 to 570 tons | | | | | | | 1 | | | |
| Total | | | | | | | 3 | | | |
| Net tonnage | | | | | | | 1,374 | | | |
| Total vessels | 210 | 17 | 4 | 10 | | | 147 | 148 | | |
| Total net tonnage | 4,481 | 994 | 90 | 64 | | | 5,615 | 1,108 | | |
| Boats: | | | | | | | | | | |
| Motor | 2 | | | 100 | 416 | 4 | 113 | 124 | 2 | |
| Other | | | | 70 | | | 32 | | | 2 |
| Accessory boats | 212 | 17 | 4 | | | | 43 | | | 2 |
| Apparatus: | | | | | | | | | | |
| Number | 212 | 17 | 4 | 170 | 416 | 4 | 26,418 | 1,360 | 2 | 4 |
| Length, yards | 115,500 | 7,240 | 468 | 12,392 | | | | | | |
| Square yards | | | | | 628,160 | 960 | | | | |
| Hooks | | | | | | | 546,786 | 6,010 | | |

| Item | Dip nets | Reef nets | Beam trawls | Otter trawls | Traps | | Tongs and rakes, oyster | Shovels | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Crab | Octopus | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | 18 | 132 | | | | | 3,367 |
| On boats and shore | 23 | 130 | 2 | | 77 | 13 | 120 | 467 | 1,852 |
| Total | 23 | 130 | 20 | 132 | 77 | 13 | 120 | 467 | 5,219 |
| Vessels: | | | | | | | | | |
| Steam, 21 to 30 tons | | | 1 | | | | | | 1 |
| Net tonnage | | | 23 | | | | | | 23 |
| Motor: | | | | | | | | | |
| 5 to 10 tons | | | 5 | 11 | | | | | 161 |
| 11 to 20 tons | | | 3 | 22 | | | | | 142 |
| 21 to 30 tons | | | | 7 | | | | | 134 |
| 31 to 40 tons | | | | 3 | | | | | 44 |
| 41 to 50 tons | | | | | | | | | 31 |
| 51 to 60 tons | | | | | | | | | 11 |
| 61 to 70 tons | | | | | | | | | 12 |
| Total | | | 8 | 43 | | | | | 535 |
| Net tonnage | | | 82 | 699 | | | | | 10,970 |
| Sail: | | | | | | | | | |
| 391 to 400 tons | | | | | | | | | 1 |
| 411 to 420 tons | | | | | | | | | 1 |
| 561 to 570 tons | | | | | | | | | 1 |
| Total | | | | | | | | | 3 |
| Net tonnage | | | | | | | | | 1,374 |
| Total vessels | | | 9 | 43 | | | | | 539 |
| Total net tonnage | | | 105 | 699 | | | | | 12,367 |
| Boats: | | | | | | | | | |
| Motor | 18 | 37 | 1 | | 64 | 6 | 30 | | 826 |
| Other | 5 | 74 | | | 13 | 7 | 85 | | 271 |
| Accessory boats | | | | | | | | | 275 |
| Apparatus: | | | | | | | | | |
| Number | 23 | 37 | 10 | 43 | 2,541 | 247 | 120 | 467 | |
| Yards at mouth | | | 66 | 645 | | | | | |

## *Fisheries of the Puget Sound District of Washington, 1937*—Continued

### CATCH: BY GEAR

| Species | Purse seines | | Haul seines [1] | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Drift | | Set[2] | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod | 700 | $13 | 300 | $6 | | | | |
| Flounders, "sole" | 800 | 22 | 11,800 | 327 | | | 300 | $8 |
| Herring | 676,100 | 7,214 | 43,900 | 468 | | | | |
| "Lingcod" | 500 | 10 | 2,900 | 58 | | | 2,900 | 58 |
| Perch | 2,500 | 91 | 112,100 | 4,092 | | | | |
| Pilchard or sardine | | | 22,500 | 450 | | | | |
| Rockfishes | 700 | 19 | 16,100 | 428 | | | 500 | 13 |
| Salmon:[6] | | | | | | | | |
| Blueback, red, or sockeye | 5,564,000 | 570,310 | | | 303,900 | $31,150 | | |
| Chinook or king | 768,400 | 34,885 | | | 1,029,700 | 56,634 | 3,400 | 206 |
| Chum or keta | 6,706,400 | 213,418 | 1,400 | 35 | 795,200 | 19,880 | 129,000 | 3,225 |
| Humpback or pink | 21,703,600 | 542,590 | 128,200 | 3,205 | 2,305,600 | 57,640 | 100 | 2 |
| Silver or coho | 4,141,500 | 216,678 | | | 873,300 | 49,179 | 22,100 | 1,470 |
| Smelt: | | | | | | | | |
| Eulachon | | | 10,200 | 760 | | | | |
| Surf or silver | | | 319,300 | 19,318 | | | | |
| Total | 39,565,200 | 1,585,250 | 668,700 | 29,147 | 5,307,700 | 214,483 | 158,300 | 4,982 |
| SHELLFISH | | | | | | | | |
| Squid | | | 1,300 | 79 | | | | |
| Octopus | | | 100 | 4 | | | | |
| Total | | | 1,400 | 83 | | | | |
| Grand total | 39,565,200 | 1,585,250 | 670,100 | 29,230 | 5,307,700 | 214.483 | 158,300 | 4,982 |

| Species | Lines | | | | Pound nets [2] | | Brush weirs | |
|---|---|---|---|---|---|---|---|---|
| | Trawl, set and hand [3] | | Troll | | | | | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod | [4]7,455,000 | $106,374 | | | | | | |
| Flounders, "sole" | 200 | 6 | | | | | | |
| Grayfish | [5]1,620,100 | 14,360 | | | | | | |
| Halibut | 23,621,000 | 2,109,289 | 68,200 | $5,034 | | | | |
| Herring | | | | | | | 407,000 | $4,343 |
| "Lingcod" | 997,800 | 41,891 | 93,300 | 2,175 | | | | |
| Rockfishes | 316,000 | 16,113 | | | | | | |
| Sablefish | 2,862,800 | 146,070 | | | | | | |
| Salmon:[6] | | | | | | | | |
| Blueback, red, or sockeye | | | | | 7,500 | $600 | | |
| Chinook or king | | | 3,647,800 | 387,396 | 96,600 | 5,859 | | |
| Chum or keta | | | | | 41,000 | 1,025 | | |
| Humpback or pink | | | 84,500 | 3,514 | 400,400 | 10,010 | | |
| Silver or coho | | | 1,266,100 | 97,110 | 39,300 | 2,074 | | |
| Tuna, albacore | | | 1,300 | 96 | | | | |
| Grand total | 36,872,900 | 2,434,103 | 5,161,200 | 495,325 | 584,800 | 19,568 | 407,000 | 4,343 |

See footnotes at end of table.

*Fisheries of the Puget Sound District of Washington, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Dip nets | | Reef nets | | Beam trawls | | Otter trawls | |
|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod | | | | | | | 437,500 | $8,312 |
| Flounders: | | | | | | | | |
| "Sole" | | | | | | | 3,759,300 | 104,133 |
| Other | | | | | | | 493,000 | 12,818 |
| Herring | 3,800 | $41 | | | | | | |
| "Lingcod" | | | | | | | 500,600 | 10,012 |
| Perch | | | | | | | 7,900 | 288 |
| Rockfishes | | | | | | | 94,700 | 2,370 |
| Salmon:[6] | | | | | | | | |
| Blueback, red or sockeye | | | 411,700 | $42,199 | | | | |
| Chinook or king | | | 26,200 | 1,189 | | | | |
| Chum or keta | | | 84,000 | 2,100 | | | | |
| Humpback or pink | | | 797,300 | 19,932 | | | | |
| Silver or coho | | | 90,300 | 4,637 | | | | |
| Total | 3,800 | 41 | 1,409,500 | 70,057 | | | 5,293,000 | 137,933 |
| SHELLFISH, ETC. | | | | | | | | |
| Shrimp | | | | | 46,900 | $6,604 | | |
| Octopus | | | | | | | 5,800 | 226 |
| Scallops, bay[10] | | | | | 24,100 | 5.745 | | |
| Trepang | | | | | 10,000 | 500 | | |
| Total | | | | | 81,000 | 12,849 | 5.800 | 226 |
| Grand total | 3.800 | 41 | 1,409,500 | 70,057 | 81,000 | 12,849 | 5,298,800 | 138,159 |

| Species | Traps | | | | Tongs, and rakes, oyster | | Shovels | |
|---|---|---|---|---|---|---|---|---|
| | Crab | | Octopus | | | | | |
| SHELLFISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs[7] | 484,100 | $24,760 | | | | | | |
| Clams, hard:[8] | | | | | | | | |
| Butter | | | | | | | 471,800 | $25,275 |
| Little-neck | | | | | | | 494,300 | 41,719 |
| Octopus | | | 58,300 | $2,274 | | | | |
| Oysters, market:[9] | | | | | | | | |
| Japanese | | | | | 630,700 | $47,302 | | |
| Native | | | | | 262,500 | 192,000 | | |
| Total | 484,100 | 24,760 | 58,300 | 2,274 | 893,200 | 239,302 | 966,100 | 66,994 |
| Grand total | 484,100 | 24,760 | 58,300 | 2,274 | 893,200 | 239,302 | 966,100 | 66,994 |

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[1] Includes the catch of smelt by bag drag nets, shown separately prior to 1935.

[2] Fished only on Indian reservations.

[3] In addition, the vessels of the Pacific coast halibut fleet landed approximately 590,000 pounds of halibut, sablefish, and "lingcod" livers at Seattle, valued at $277,400.

[4] Most of these cod were taken off Alaska.

[5] Caught almost entirely for the utilization of the livers for grayfish oil. Most of the fish carcasses were discarded.

[6] Statistics on the catch of salmon except those taken by troll lines, are reported to the State in number rather than pounds. The factors used in the above table for converting number of salmon to weight in pounds were as follows: Blueback, red, or sockeye, 7 pounds; chinook, or king, 19.77 pounds; chum or keta, 10 pounds; humpback, or pink, 5 pounds; and silver, or coho, 7.97 pounds.

[7] The weight of crabs shown is based on an average of 20 pounds per dozen.

[8] Statistics on hard clams are based on yields of 28 percent edible meats for butter clams and 24 percent for little-neck clams.

[9] Statistics on oysters are based on yields of 18 percent edible meats for native oysters and 10 percent for Japanese oysters.

[10] The weight of bay scallops is based on a yield of 17 percent edible meat.

## *Fisheries of the coastal district of Washington, 1937*

### OPERATING UNITS: BY GEAR [1]

| Item | Haul seines | Gill nets | | Lines, troll | Dip nets | Traps, crab | Tongs and rakes, oyster | Dredges, oyster | Shovels | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Drift | Set | | | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | 63 | | 14 | | 8 | | 81 |
| On boats and shore | 22 | 223 | 125 | 154 | 60 | 63 | 265 | | 3,023 | 3,794 |
| Total | 22 | 223 | 125 | 217 | 60 | 77 | 265 | 8 | 3,023 | 3,875 |
| Vessels, motor: | | | | | | | | | | |
| 5 to 10 tons | | | | 32 | | 6 | | 2 | | 38 |
| 11 to 21 tons | | | | 2 | | 1 | | | | 3 |
| Total | | | | 34 | | 7 | | 2 | | 41 |
| Net tonnage | | | | 232 | | 65 | | 13 | | 293 |
| Boats: | | | | | | | | | | |
| Motor | | 184 | 89 | 96 | 10 | 39 | 75 | | | 481 |
| Other | 4 | | 36 | | | | 165 | 2 | | 207 |
| Apparatus: | | | | | | | | | | |
| Number | 4 | 184 | 125 | 650 | 60 | 2,863 | 230 | 4 | 3,023 | |
| Length, yards | 280 | | | | | | | | | |
| Square yards | | 354,752 | 27,600 | | | | | | | |
| Yards at mouth | | | | | | | | 8 | | |
| Hooks | | | | 2,925 | | | | | | |

[1] In addition, a combined fleet of 15 Puget Sound, Oregon, and California purse-seine vessels operated in the Washington coast pilchard fishery. These vessels were manned by a total of 171 fishermen and had an aggregate capacity of 963 net tons. Of the total vessels 10 were from Puget Sound, 1 from Oregon, and 4 from California. For detailed statistics regarding the operating units in this fishery, refer to the gear tables in the Puget Sound, Oregon, and California sections of this report.

### CATCH: BY GEAR

| Species | Purse seines, sardine | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Drift | | Set [1] | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Pilchard or sardine | 34,406,600 | $223,643 | | | | | | |
| Salmon:[2] | | | | | | | | |
| Blueback, red or sockeye | | | | | | | 419,500 | $46,149 |
| Chinook or king | | | 800 | $38 | 548,300 | $26,373 | 113,500 | 3,052 |
| Chum or keta | | | 1,500 | 19 | 992,100 | 12,401 | 253,600 | 3,170 |
| Silver or coho | | | 24,000 | 960 | 379,000 | 15,160 | 251,500 | 8,930 |
| Smelt, surf or silver | | | 38,500 | 2,118 | | | | |
| Steelhead trout [3] | | | | | | | 21,300 | 2,012 |
| Sturgeon | | | | | 41,200 | 2,678 | | |
| Total | 34,406,600 | 223,643 | 64,800 | 3,135 | 1,960,600 | 56,612 | 1,059,400 | 63,313 |

| Species | Lines, troll | | Dip nets | | Otter trawls | |
|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders, "sole" | | | | | 1,500 | $30 |
| Halibut | 1,300 | $100 | | | | |
| "Lingcod" | 10,200 | 408 | | | | |
| Rockfishes | 300 | 6 | | | | |
| Salmon:[2] | | | | | | |
| Chinook or king | 1,262,800 | 144,338 | | | | |
| Humpback or pink | 4,800 | 230 | | | | |
| Silver or coho | 959,800 | 76,880 | | | | |
| Smelt, surf or silver | | | 9,900 | $544 | | |
| Tuna, albacore | 277,600 | 17,255 | | | | |
| Total | 2,516,800 | 239,217 | 9,900 | 544 | 1,500 | 30 |

See footnotes at end of table.

## *Fisheries of the coastal district of Washington, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Traps, crab | | Dredges, tongs, and rakes | | Shovels | |
|---|---|---|---|---|---|---|
| SHELLFISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs [4] | 1,875,700 | $150,056 | | | | |
| Clams, razor [5] | | | | | 424,200 | $79,843 |
| Oysters, market: [6] | | | | | | |
| Eastern | | | 800 | $300 | | |
| Japanese | | | 7,082,000 | 495,739 | | |
| Native | | | 3,500 | 1,950 | | |
| Total | 1,875,700 | 150,056 | 7,086,300 | 497,989 | 424,200 | 79,843 |

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[1] Fished by Indians on their reservations.

[2] Statistics on the catch of salmon except those taken by troll lines are reported to the State in number rather than pounds. The factors used in the above table for converting number of salmon to weight in pounds were as follows: Blueback, red, or sockeye, 5 pounds; chinook or king, 20.78 pounds; chum or keta, 11.09 pounds; silver or coho, 10 pounds; and steelhead trout, 9 pounds.

[3] Steelhead trout shown in this table were taken on Indian reservations.

[4] The weight of crabs shown is based on an average of 22 pounds per dozen.

[5] The weight of razor clams shown is in pounds of edible meats, based on a yield of 42 percent of the round weight.

[6] The statistics on oysters used in this table are based on a yield of 12 percent of edible meats for Japanese and native oysters and 13 percent for eastern oysters.

## *Fisheries of the Columbia River district of Washington, 1937*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Gill nets, drift | Lines | | Dip nets | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| | | | Trawl and set | Troll | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | 7 | 18 | | 25 |
| On boats and shore | 3 | 631 | 69 | 52 | 222 | 888 |
| Total | 3 | 631 | 76 | 70 | 222 | 913 |
| Vessels, motor: | | | | | | |
| 5 to 10 tons | | | 1 | 6 | | 7 |
| 11 to 20 tons | | | | 3 | | 3 |
| 21 to 30 tons | | | 1 | | | 1 |
| Total | | | 2 | 9 | | 11 |
| Net tonnage | | | 30 | 83 | | 113 |
| Boats: | | | | | | |
| Motor | 1 | 471 | 55 | 30 | 112 | 619 |
| Other | 1 | | 14 | | 7 | 22 |
| Apparatus: | | | | | | |
| Number | 1 | 471 | 349 | 195 | 222 | |
| Length, yards | 167 | | | | | |
| Square yards | | 1,303,728 | | | | |
| Hooks | | | 17,680 | 862 | | |

*Fisheries of the Columbia River district of Washington, 1937*—Continued

CATCH: BY GEAR

| Species | Haul seines | | Gill nets, drift | | Lines | | | | Dip nets | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Trawl and set | | Troll | | | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Carp | 126,700 | $3,458 | | | | | | | | |
| Flounders, other than "sole" | | | 29,300 | $293 | 900 | $33 | | | | |
| Halibut | | | | | 43,100 | 4,245 | | | | |
| "Lingcod" | | | | | 2,800 | 111 | | | | |
| Rockfishes | | | 800 | 8 | 15,500 | 480 | | | | |
| Sablefish | | | | | 204,700 | 9,140 | | | | |
| Salmon: | | | | | | | | | | |
| Blueback, red or sockeye | | | 42,600 | 5,964 | | | | | 45,500 | $6,370 |
| Chinook or king | | | 4,523,700 | 356,468 | | | 197,900 | $19,600 | 405,500 | 31,953 |
| Chum or keta | | | 851,700 | 12,776 | | | | | | |
| Silver or coho | | | 497,300 | 24,865 | | | 407,800 | 24,656 | | |
| Shad | | | 37,600 | 978 | | | | | | |
| Smelt, eulachon | | | 371,600 | 26,012 | | | | | 180,300 | 10,818 |
| Steelhead trout | | | 285,400 | 16,839 | | | 100 | 6 | 33,100 | 1,953 |
| Sturgeon | | | 15,800 | 360 | 15,800 | 360 | | | | |
| Tuna, albacore | | | | | | | 141,700 | 8,499 | | |
| Total | 126,700 | 3,458 | 6,655,800 | 444,563 | 282,800 | 14,369 | 747,500 | 52,761 | 664,400 | 51,094 |

## OREGON

*Fisheries of Oregon, 1937*

CATCH: BY DISTRICTS

| Species | Columbia River district | | Coastal district | |
|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod | 12,700 | $190 | | |
| Flounders: | | | | |
| "Sole" | 538,700 | 9,747 | 111,700 | $2,102 |
| Other | 260,800 | 2,732 | 700 | 18 |
| Halibut | 292,400 | 25,446 | 74,800 | 6,224 |
| Herring | | | 30,000 | 402 |
| "Lingcod" | 121,300 | 4,206 | 30,400 | 884 |
| Perch | | | 600 | 12 |
| Pilchard or sardine | | | 33,462,500 | 217,506 |
| Rockfishes | 117,000 | 3,185 | 36,800 | 1,274 |
| Sablefish | 80,500 | 3,715 | 67,200 | 2,876 |
| Salmon: | | | | |
| Blueback, red or sockeye | 247,000 | 34,580 | | |
| Chinook or king | 13,878,600 | 1,100,868 | 2,180,400 | 169,258 |
| Chum or keta | 1,058,100 | 15,871 | 521,000 | 10,420 |
| Humpback or pink | 100 | 3 | 300 | 9 |
| Silver or coho | 2,019,300 | 112,291 | 5,196,500 | 256,399 |
| Shad | 241,900 | 6,290 | 282,700 | 9,894 |
| Smelt, eulachon | 472,800 | 33,096 | | |
| Steelhead trout | 1,614,500 | 95,256 | 110,600 | 6,113 |
| Striped bass | | | 34,100 | 1,855 |
| Sturgeon | 79,700 | 1,817 | 2,200 | 75 |
| Tuna, albacore | 857,200 | 52,838 | 222,200 | 13,308 |
| Total | 21,892,600 | 1,502,131 | 42,364,700 | 698,629 |
| SHELLFISH | | | | |
| Crabs | | | 4,372,000 | 367,248 |
| Crawfish, fresh-water | 84,200 | 9,262 | | |
| Clams: | | | | |
| Razor | | | 56,500 | 13,447 |
| Mixed | | | 77,800 | 6,682 |
| Oysters, market: | | | | |
| Japanese | | | 87,500 | 5,400 |
| Native | | | 9,600 | 6,440 |
| Total | 84,200 | 9,262 | 4,603,400 | 399,217 |
| Grand total | 21,976,800 | 1,511,393 | 46,968,100 | 1,097,846 |

### *Fisheries of the Columbia River district of Oregon, 1937*

#### OPERATING UNITS: BY GEAR [1]

| Item | Purse seines, pilchard | Haul seines | Gill nets | | Lines | | Pound nets | Dip nets | Otter trawls | Traps, crawfish | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Drift, salmon | Set, salmon | Trawl and set | Troll | | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | | | |
| On vessels | 23 | | | | 24 | 76 | | | 6 | | 129 |
| On boats and shore | | 514 | 1,088 | 78 | 62 | 141 | 45 | 163 | | 25 | 2,036 |
| Total | 23 | 514 | 1,088 | 78 | 86 | 217 | 45 | 163 | 6 | 25 | 2,165 |
| Vessels, motor: | | | | | | | | | | | |
| 5 to 10 tons | | | | | 2 | 35 | | | | | 37 |
| 11 to 20 tons | | | | | 4 | 5 | | | 2 | | 10 |
| 61 to 70 tons | 1 | | | | | | | | | | 1 |
| 101 to 110 tons | 1 | | | | | | | | | | 1 |
| Total | 2 | | | | 6 | 40 | | | 2 | | 49 |
| Net tonnage | 172 | | | | 78 | 309 | | | 34 | | 578 |
| Boats: | | | | | | | | | | | |
| Motor | | 23 | 703 | 71 | 56 | 115 | 21 | | | 17 | 910 |
| Other | | 44 | | 7 | 6 | | 21 | | | 8 | 80 |
| Accessory boats | 2 | | | | | | | | | | 2 |
| Apparatus: | | | | | | | | | | | |
| Number | 2 | 44 | 703 | 137 | 706 | 808 | 27 | 163 | 2 | 1,125 | |
| Length, yards | 885 | 23,072 | | | | | | | | | |
| Square yards | | | 2,240,082 | 38,360 | | | | | | | |
| Yards at mouth | | | | | | | | | 40 | | |
| Hooks | | | | | 18,940 | 3,426 | | | | | |

[1] In addition to the operating units shown, 2 California vessels with a combined crew of 11, and a total net tonnage of 22 tons, operated a paranzella net from the Oregon Columbia River district. These craft are included in the California operating unit tables.

#### CATCH: BY GEAR [1]

| Species | Haul seines | | Gill nets | | | | Lines | |
|---|---|---|---|---|---|---|---|---|
| | | | Drift | | Set | | Trawl and set | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders: | | | | | | | | |
| "Sole" | | | | | | | 17,300 | $623 |
| Other | | | 239,800 | $2,398 | | | | |
| Halibut | | | | | | | 291,300 | 25,372 |
| "Lingcod" | | | | | | | 92,700 | 3,671 |
| Rockfishes | | | | | | | 65,900 | 2,564 |
| Sablefish | | | | | | | 79,500 | 3,675 |
| Salmon: | | | | | | | | |
| Blueback, red or sockeye | 40,100 | $5,614 | 110,800 | 15,512 | 6,200 | $868 | | |
| Chinook or king | 2,799,500 | 220,601 | 9,123,300 | 718,916 | 32,700 | 2,577 | | |
| Chum or keta | 96,800 | 1,452 | 924,200 | 13,863 | 4,300 | 64 | | |
| Silver or coho | 198,000 | 9,900 | 571,600 | 28,580 | 1,500 | 75 | | |
| Shad | 127,600 | 3,318 | 113,300 | 2,946 | 900 | 23 | | |
| Smelt, eulachon | | | 472,800 | 33,096 | | | | |
| Steelhead trout | 654,600 | 38,621 | 579,900 | 34,214 | 6,800 | 401 | | |
| Sturgeon | 1,300 | 30 | 44,800 | 1,021 | 100 | 2 | 28,200 | 643 |
| Total | 3,917,900 | 279,536 | 12,180,500 | 850,546 | 52,500 | 4,010 | 574,900 | 36,548 |

See footnotes at end of table.

### *Fisheries of the Columbia River district of Oregon, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Lines—Contd. | | Pound nets | | Dip nets | | Otter trawls and paranzella nets [2] | | Traps, crawfish | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Troll | | | | | | | | | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod | | | | | | | 12,700 | $190 | | |
| Flounders: | | | | | | | | | | |
| "Sole" | | | | | | | 521,400 | 9,124 | | |
| Other | | | | | | | 21,000 | 334 | | |
| Halibut | | | | | | | 1,100 | 74 | | |
| "Lingcod" | 10,800 | $131 | | | | | 17,800 | 404 | | |
| Rockfishes | 38,200 | 382 | | | | | 12,900 | 239 | | |
| Sablefish | | | | | | | 1,000 | 40 | | |
| Salmon: | | | | | | | | | | |
| Blueback, red or sockeye | | | 10,300 | $1,442 | 79,600 | $11,144 | | | | |
| Chinook or king | 357,400 | 35,397 | 478,100 | 37,674 | 1,087,600 | 85,703 | | | | |
| Chum or keta | | | 32,800 | 492 | | | | | | |
| Humpback or pink | 100 | 3 | | | | | | | | |
| Silver or coho | 1,082,800 | 65,466 | 164,900 | 8,245 | 500 | 25 | | | | |
| Shad | | | 100 | 3 | | | | | | |
| Steelhead trout | 500 | 30 | 228,500 | 13,482 | 144,200 | 8,508 | | | | |
| Sturgeon | | | 400 | 9 | 4,900 | 112 | | | | |
| Tuna, albacore | 857,200 | 52,838 | | | | | | | | |
| Total | 2,347,000 | 154,247 | 915,100 | 61,347 | 1,316,800 | 105,492 | 587,900 | 10,405 | | |
| SHELLFISH | | | | | | | | | | |
| Crawfish, fresh-water | | | | | | | | | 84,200 | $9,262 |
| Grand total | 2,347,000 | 154,247 | 915,100 | 61,347 | 1,316,800 | 105,492 | 587,900 | 10,405 | 84,200 | 9,262 |

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[1] Of the species listed the following are taken off the Oregon and Washington coasts but landed in the Columbia River district: "Sole", halibut, "lingcod", rockfishes, sablefish, and tuna. Most of the troll-caught salmon were also taken in coastal waters.

[2] The catch by paranzella nets was made by fishermen from California.

### *Fisheries of the coastal district of Oregon, 1937*

OPERATING UNITS: BY GEAR

| Item | Purse [1] seines, pilchard | Haul seines | Gill nets | | Lines | | Otter trawls | Traps, crab | Tongs and rakes, oyster | Shovels | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Drift | Set | Trawl and set | Troll | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 13 | | | | 4 | 18 | 6 | 18 | | | 49 |
| On boats and shore | | 12 | 503 | 296 | 2 | 90 | | 255 | 18 | 177 | 1,228 |
| Total | 13 | 12 | 503 | 296 | 6 | 108 | 6 | 273 | 18 | 177 | 1,277 |
| Vessels, motor: | | | | | | | | | | | |
| 5 to 10 tons | | | | | 1 | 8 | | 8 | | | 12 |
| 11 to 20 tons | | | | | | 1 | 2 | 1 | | | 4 |
| 101 to 110 tons | 1 | | | | | | | | | | 1 |
| Total | 1 | | | | 1 | 9 | 2 | 9 | | | 17 |
| Net tonnage | 104 | | | | 9 | 73 | 32 | 82 | | | 261 |
| Boats: | | | | | | | | | | | |
| Motor | | 4 | 410 | 197 | 1 | 74 | | 250 | 2 | | 835 |
| Other | | 4 | | 80 | | | | | 8 | 18 | 110 |
| Accessory boats | 1 | | | | | | | | | | 1 |
| Apparatus: | | | | | | | | | | | |
| Number | 1 | 4 | 410 | 903 | 160 | 415 | 2 | 16,835 | 18 | 177 | |
| Length, yards | 500 | 666 | | | | | | | | | |
| Square yards | | | 577,690 | 321,480 | | | | | | | |
| Yards at mouth | | | | | | | 40 | | | | |
| Hooks | | | | | 2,880 | 1,840 | | | | | |

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[1] In addition there was a combined fleet of 32 Washington, Oregon, and California purse-seine vessels operated in the Oregon coast pilchard fishery. The vessels were manned by a total of 363 fishermen and had an aggregate tonnage of 1,961 net tons. Of the total vessels, 2 were from the Columbia River district of Oregon, 8 from Washington, and 22 were from California. For detailed statistics regarding the operating units in this fishery refer to the gear tables in the Oregon Columbia River, Washington, and California sections of this report.

## *Fisheries of the coastal district of Oregon, 1937*—Continued

### CATCH: BY GEAR

| Species | Purse seines, pilchard [1] | | Haul seines | | Gill nets, drift and set | | Lines | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Trawl and set | | Troll | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders: | | | | | | | | | | |
| "Sole" | | | | | | | 14,800 | $416 | | |
| Other | | | | | | | 700 | 18 | | |
| Halibut | | | | | | | 70,400 | 5,878 | 3,700 | $299 |
| Herring | | | 30,000 | $402 | | | | | | |
| "Lingcod" | | | | | | | 14,200 | 522 | 3,900 | 83 |
| Pilchard or sardine | 33,462,500 | $217,506 | | | | | | | | |
| Rockfishes | | | | | | | 35,600 | 1,232 | 600 | 31 |
| Sablefish | | | | | | | 67,200 | 2,876 | | |
| Salmon: | | | | | | | | | | |
| Chinook or king | | | | | 1,145,700 | $91,656 | | | 1,034,700 | 77,602 |
| Chum or keta | | | | | 521,000 | 10,420 | | | | |
| Humpback or pink | | | | | | | | | 300 | 9 |
| Silver or coho | | | | | 3,227,600 | 161,380 | | | 1,968,900 | 95,019 |
| Shad | | | | | 282,700 | 9,894 | | | | |
| Steelhead trout | | | | | 110,600 | 6,113 | | | | |
| Striped bass | | | | | 34,100 | 1,855 | | | | |
| Sturgeon | | | | | 2,200 | 75 | | | | |
| Tuna, albacore | | | | | | | | | 222,200 | 13,308 |
| Total | 33,462,500 | 217,506 | 30,000 | 402 | 5,323,900 | 281,393 | 202,900 | 10,942 | 3,234,300 | 186.351 |

| Species | Otter trawls | | Traps, crab | | Tongs and rakes | | Shovels | |
|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders, "sole" | 96,900 | $1,686 | | | | | | |
| Halibut | 700 | 47 | | | | | | |
| "Lingcod" | 12,300 | 279 | | | | | | |
| Perch | 600 | 12 | | | | | | |
| Rockfishes | 600 | 11 | | | | | | |
| Total | 111,100 | 2,035 | | | | | | |
| SHELLFISH | | | | | | | | |
| Crabs | | | 4,372,000 | $367,248 | | | | |
| Clams: | | | | | | | | |
| Razor [2] | | | | | | | 56,500 | $13,447 |
| Mixed [3] | | | | | | | 77,800 | 6,682 |
| Oysters, market: | | | | | | | | |
| Japanese | | | | | 87,500 | $5,400 | | |
| Native | | | | | 9,600 | 6,440 | | |
| Total | | | 4,372.000 | 367,248 | 97,100 | 11,840 | 134,300 | 20,129 |
| Grand total | 111,100 | 2,035 | 4,372,000 | 367,248 | 97,100 | 11,840 | 134,300 | 20,129 |

[1] The Oregon coast pilchard fishery was prosecuted almost entirely by Washington and California purse-seine vessels. See separate sections for data on operating units in the fishery.

[2] The weight of razor clams is that of edible meats, based on a yield of 42 percent of the round weight.

[3] Mixed clams consist principally of eastern soft-shell clams. The weight shown in that of edible meats, based on a yield of 21 percent of the round weight.

## CALIFORNIA

### *Fisheries of California, 1937*

CATCH: BY DISTRICTS

| Species | Northern district | | San Francisco district | | Monterey district | |
|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Anchovies |  |  | 102, 100 | $1, 531 | 44, 200 | $854 |
| Carp |  |  | 36, 400 | 1, 418 |  |  |
| Catfish |  |  | 302, 900 | 34, 437 |  |  |
| Cod [1] |  |  | 4, 731, 400 | 80, 671 |  |  |
| Flounders: |  |  |  |  |  |  |
| "California halibut" |  |  | 8, 900 | 1, 338 | 19, 000 | 2, 104 |
| "Sole" | 3, 374, 000 | $179, 139 | 4, 403, 000 | 258, 739 | 225, 000 | 10, 785 |
| Other | 370, 000 | 12, 949 | 1, 136, 100 | 40, 127 | 52, 500 | 2, 122 |
| Grayfish | 6, 400 | 146 | 396, 300 | 2, 058 | 127, 800 | 1, 305 |
| Hake | 700 | 8 | 59, 200 | 592 | 1, 200 | 12 |
| Halibut | 316, 900 | 26, 507 |  |  |  |  |
| Hardhead |  |  | 54, 200 | 4, 894 |  |  |
| Herring | 6, 500 | 50 | 613, 400 | 4, 601 | 4, 300 | 65 |
| Horse mackerel |  |  |  |  | 42, 200 | 2, 874 |
| Kingfish |  |  | 5, 200 | 262 | 134, 800 | 5, 260 |
| "Lingcod" | 449, 500 | 16, 745 | 399, 400 | 17, 671 | 117, 500 | 6, 770 |
| Mackerel |  |  | 11, 500 | 633 | 2, 019, 500 | 44, 020 |
| Perch | 11, 000 | 323 | 98, 600 | 3, 285 | 39, 900 | 1, 778 |
| Pilchard or sardines |  |  | 435, 550, 200 | 2, 727, 032 | 279, 194, 300 | 1, 694, 374 |
| Pompano |  |  |  |  | 100 | 47 |
| Rockfishes | 454, 600 | 17, 794 | 693, 100 | 39, 580 | 2, 127, 900 | 86, 564 |
| Sablefish | 571, 100 | 22, 295 | 20, 800 | 623 | 4, 200 | 93 |
| Salmon | 3, 834, 500 | 301, 712 | 2, 181, 300 | 147, 915 | 891, 100 | 79, 328 |
| Sculpin |  |  | 3, 500 | 87 | 4, 400 | 58 |
| Sea bass: |  |  |  |  |  |  |
| Black |  |  |  |  | 100 | 5 |
| White |  |  | 11, 600 | 1, 745 | 28, 200 | 2, 969 |
| Shad |  |  | 651, 000 | 29, 156 |  |  |
| Skates | 37, 600 | 751 | 330, 000 | 6, 600 | 21, 400 | 424 |
| Smelt | 13, 700 | 505 | 322, 800 | 13, 291 | 91, 900 | 4, 865 |
| Splittail |  |  | 10, 800 | 371 |  |  |
| Squawfish |  |  | 500 | 23 |  |  |
| Suckers |  |  | 7, 900 | 219 |  |  |
| Tomcod |  |  | 1, 100 | 35 |  |  |
| Tuna and tunalike fishes: |  |  |  |  |  |  |
| Albacore | 200 | 18 | 700 | 55 | 582, 700 | 50, 985 |
| Bonito |  |  |  |  | 300 | 15 |
| Whitebait | 75, 800 | 3, 877 | 8, 700 | 621 | 1, 600 | 167 |
| Other fish | 72, 100 | 1, 064 | 80, 300 | 1, 207 | 2, 600 | 60 |
| Total | 9, 594, 600 | 583, 883 | 452, 232, 900 | 3, 420, 817 | 285, 778, 700 | 1, 997, 903 |
| SHELLFISH |  |  |  |  |  |  |
| Crabs | 191, 800 | 15, 399 | 1, 418, 500 | 162, 532 | 12, 300 | 1, 056 |
| Shrimp |  |  | 1, 108, 700 | 16, 260 | 3, 000 | 655 |
| Abalone |  |  |  |  | 286, 600 | 63, 261 |
| Clams: |  |  |  |  |  |  |
| Hard | 4, 900 | 608 | 1, 600 | 426 |  |  |
| Pismo |  |  |  |  | 3, 500 | 866 |
| Soft |  |  | 29, 700 | 7, 891 |  |  |
| Mussels |  |  |  |  | 200 | 17 |
| Octopus | 600 | 25 | 3, 700 | 234 | 19, 200 | 1, 587 |
| Oysters, market: |  |  |  |  |  |  |
| Eastern | 1, 200 | 266 | 66, 100 | 22, 781 |  |  |
| Japanese |  |  | 90, 700 | 13, 602 |  |  |
| Native |  |  | 5, 300 | 1, 768 |  |  |
| Squid |  |  | 500 | 30 | 464, 700 | 14, 142 |
| Total | 198, 500 | 16, 298 | 2, 724, 800 | 225, 524 | 789, 500 | 81, 584 |
| WHALE PRODUCTS |  |  |  |  |  |  |
| Whale meat |  |  | 624, 900 | 12, 207 |  |  |
| Whale oil |  |  | 513, 200 | 29, 016 |  |  |
| Total |  |  | 1, 138, 100 | 41, 223 |  |  |
| Grand total | 9, 793, 100 | 600, 181 | 456, 095, 800 | 3, 687, 564 | 286, 568, 200 | 2, 079, 487 |

[1] The catch of cod was taken off Alaska.

*Fisheries of California, 1937*—Continued

CATCH: BY DISTRICTS—Continued

| Species | San Pedro district | | | | | |
|---|---|---|---|---|---|---|
| | Off California | | Off Latin America | | Total | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Anchovies | 79,900 | $854 | | | 79,900 | $854 |
| Barracuda | 1,418,400 | 76,434 | 453,400 | $33,032 | 1,871,800 | 109,466 |
| Cabrilla | | | 59,700 | 3,359 | 59,700 | 3,359 |
| Flounders: | | | | | | |
| "California halibut" | 652,100 | 57,602 | 27,800 | 2,502 | 679,900 | 60,104 |
| "Sole" | 300,200 | 8,951 | | | 300,200 | 8,951 |
| Other | 8,300 | 1,308 | | | 8,300 | 1,308 |
| Flyingfish | 41,900 | 1,834 | | | 41,900 | 1,834 |
| Grayfish | 305,500 | 10,314 | 2,000 | 83 | 307,500 | 10,397 |
| Groupers | | | 4,500 | 300 | 4,500 | 300 |
| Hake | 2,300 | 56 | | | 2,300 | 56 |
| Horse mackerel | 6,400,800 | 60,948 | 500 | 29 | 6,401,300 | 60,977 |
| Kingfish | 504,900 | 10,142 | | | 504,900 | 10,142 |
| "Lingcod" | 1,800 | 98 | | | 1,800 | 98 |
| Mackerel | 55,505,200 | 587,798 | | | 55,505,200 | 587,798 |
| Marlin | 3,600 | 148 | 500 | 34 | 4,100 | 182 |
| Mullet | 3,000 | 294 | | | 3,000 | 294 |
| Perch | 61,400 | 3,943 | | | 61,400 | 3,943 |
| Pilchard or sardines | 347,461,100 | 1,903,208 | | | 347,461,100 | 1,903,208 |
| Pompano | 4,700 | 2,330 | | | 4,700 | 2,330 |
| Rock bass | 117,100 | 8,299 | 19,400 | 1,271 | 136,500 | 9,570 |
| Rockfishes | 712,200 | 30,780 | | | 712,200 | 30,780 |
| Rudderfishes | 35,400 | 1,764 | | | 35,400 | 1,764 |
| Sablefish | 137,300 | 6,412 | | | 137,300 | 6,412 |
| Salmon | 900 | 38 | | | 900 | 38 |
| Sculpin | 128,400 | 10,309 | | | 128,400 | 10,309 |
| Sea bass: | | | | | | |
| Black | 17,100 | 873 | 456,800 | 26,727 | 473,900 | 27,600 |
| White | 138,200 | 15,826 | 11,400 | 1,060 | 149,600 | 16,886 |
| Sheepshead | 70,200 | 2,571 | 1,300 | 56 | 71,500 | 2,627 |
| Skates | 57,100 | 722 | | | 57,100 | 722 |
| Smelt | 249,000 | 10,145 | | | 249,000 | 10,145 |
| Spanish mackerel | | | 19,000 | 1,077 | 19,000 | 1,077 |
| Swordfish | 398,300 | 56,572 | | | 398,300 | 56,572 |
| Tuna and tuna-like fishes: | | | | | | |
| Albacore | 1,110,000 | 111,082 | | | 1,110,000 | 111,082 |
| Bluefin | 9,978,100 | 572,278 | 1,316,700 | 73,591 | 11,294,800 | 645,869 |
| Bonito | 4,305,400 | 161,101 | 865,600 | 32,454 | 5,171,000 | 193.555 |
| Skipjack or striped tuna | 575,400 | 28,771 | 15,008,700 | 747,697 | 15,584,100 | 776,468 |
| Yellowfin | 155,500 | 9,688 | 25,961,500 | 1,545,852 | 26,117,000 | 1,555.540 |
| Whitefish | 26,100 | 1,452 | 3,900 | 215 | 30,000 | 1,667 |
| Yellowtail | 125,000 | 6,455 | 419,400 | 17,026 | 544,400 | 23,481 |
| Other fish | 9,900 | 370 | 1,400 | 93 | 11,300 | 463 |
| Total | 431,101,700 | 3,761,770 | 44,633,500 | 2,486,458 | 475,735,200 | 6,248,228 |
| SHELLFISH | | | | | | |
| Crabs | 1,600 | 48 | | | 1,600 | 48 |
| Sea crawfish or spiny lobster | 309,600 | 57,876 | 1,500 | 304 | 311,100 | 58,180 |
| Abalone | 286,000 | 29,393 | | | 286,000 | 29,393 |
| Clams: | | | | | | |
| Hard | 6,700 | 1,746 | | | 6,700 | 1,746 |
| Pismo | 52,500 | 9,967 | | | 52,500 | 9,967 |
| Octopus | 400 | 44 | | | 400 | 44 |
| Squid | 36,400 | 1,208 | | | 36,400 | 1,208 |
| Total | 693,200 | 100,282 | 1,500 | 304 | 694,700 | 100,586 |
| Grand total | 431,794,900 | 3,862,052 | 44,635,000 | 2,486,762 | 476,429,900 | 6,348,814 |

## *Fisheries of California, 1937*—Continued

### CATCH: BY DISTRICTS—Continued

| Species | San Diego district | | | | Total | |
|---|---|---|---|---|---|---|
| | Off California | | Off Latin America | | | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Barracuda | 375,200 | $15,782 | 686,000 | $35,272 | 1,061,200 | $51,054 |
| Cabrilla | ---------- | ---------- | 71,500 | 3,559 | 71,500 | 3,559 |
| Flounders, "California halibut" | 132,200 | 9,991 | 366,900 | 28,697 | 499,100 | 38,688 |
| Grayfish | 70,300 | 983 | 4,800 | 120 | 75,100 | 1,103 |
| Groupers | 100 | 4 | 53,300 | 2,582 | 53,400 | 2,586 |
| Herring | 7,100 | 61 | ---------- | ---------- | 7,100 | 61 |
| Horse mackerel | 98,100 | 952 | ---------- | ---------- | 98,100 | 952 |
| Kingfish | 700 | 19 | ---------- | ---------- | 700 | 19 |
| "Lingcod" | ---------- | ---------- | 100 | 3 | 100 | 3 |
| Mackerel | 3,295,900 | 35,641 | 104,300 | 1,285 | 3,400,200 | 36,926 |
| Mullet | 5,500 | 437 | ---------- | ---------- | 5,500 | 437 |
| Perch | 2,100 | 36 | 400 | 17 | 2,500 | 53 |
| Pilchard or sardines | 9,407,700 | 48,619 | 100 | 1 | 9,407,800 | 48,620 |
| Pompano | 100 | 17 | 200 | 40 | 300 | 57 |
| Rock bass | 113,100 | 5,225 | 74,700 | 3,229 | 187,800 | 8,454 |
| Rockfishes | 143,600 | 6,952 | 159,500 | 7,814 | 303,100 | 14,766 |
| Rudderfishes | 200 | 5 | 500 | 14 | 700 | 19 |
| Sablefish | 200 | 5 | ---------- | ---------- | 200 | 5 |
| Sculpin | 9,000 | 539 | 200 | 9 | 9,200 | 548 |
| Sea bass: | | | | | | |
| Black | 3,200 | 149 | 237,000 | 11,995 | 240,200 | 12,144 |
| White | 87,500 | 7,150 | 325,400 | 28,060 | 412,900 | 35,210 |
| Sheepshead | 2,900 | 120 | 7,000 | 251 | 9,900 | 371 |
| Skates | 1,400 | 14 | ---------- | ---------- | 1,400 | 14 |
| Smelt | 2,400 | 122 | 2,200 | 113 | 4,600 | 235 |
| Spanish mackerel | ---------- | ---------- | 7,700 | 274 | 7,700 | 274 |
| Swordfish | 191,600 | 23,953 | 35,400 | 4,481 | 227,000 | 28,434 |
| Tuna and tunalike fishes: | | | | | | |
| Albacore | 326,400 | 32,688 | ---------- | ---------- | 326,400 | 32,688 |
| Bluefin | 844,000 | 47,393 | 555,100 | 31,651 | 1,399,100 | 79,044 |
| Bonito | 1,401,500 | 47,438 | 1,235,200 | 45,274 | 2,636,700 | 92,712 |
| Skipjack | 1,308,700 | 65,437 | 30,211,300 | 1,476,618 | 31,520,000 | 1,542,055 |
| Yellowfin | 32,300 | 1,978 | 65,373,200 | 3,900,301 | 65,405,500 | 3,902,279 |
| Whitefish | 6,200 | 305 | 20,900 | 1,060 | 27,100 | 1,365 |
| Yellowtail | 98,500 | 4,845 | 4,728,100 | 183,682 | 4,826,600 | 188,527 |
| Other fish | 500 | 12 | ---------- | ---------- | 500 | 12 |
| Total | 17,968,200 | 356,872 | 104,261,000 | 5,766,402 | 122,229,200 | 6,123,274 |
| SHELLFISH | | | | | | |
| Sea crawfish or spiny lobster | 76,300 | 14,115 | 935,000 | 91,364 | 1,011,300 | 105,479 |
| Grand total | 18,044,500 | 370,987 | 105,196,000 | 5,857,766 | 123,240,500 | 6,228,753 |

### CATCH: BY WATERS

| Species | Off California | | Off Latin America | |
|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* |
| Anchovies | 226,200 | $3,239 | ---------- | ---------- |
| Barracuda | 1,793,600 | 92,216 | 1,139,400 | $68,304 |
| Cabrilla | ---------- | ---------- | 131,200 | 6,918 |
| Carp | 36,400 | 1,418 | ---------- | ---------- |
| Catfish | 302,900 | 34,437 | ---------- | ---------- |
| Cod [1] | 4,731,400 | 80,671 | ---------- | ---------- |
| Flounders: | | | | |
| "California halibut" | 812,200 | 71,035 | 394,700 | 31,199 |
| "Sole" | 8,302,200 | 457,614 | ---------- | ---------- |
| Other | 1,566,900 | 56,506 | ---------- | ---------- |
| Flyingfish | 41,900 | 1,834 | ---------- | ---------- |
| Grayfish | 906,300 | 14,806 | 6,800 | 203 |
| Groupers | 100 | 4 | 57,800 | 2,882 |
| Hake | 63,400 | 668 | ---------- | ---------- |
| Halibut | 316,900 | 26,507 | ---------- | ---------- |
| Hardhead | 54,200 | 4,894 | ---------- | ---------- |
| Herring | 631,300 | 4,777 | ---------- | ---------- |
| Horse mackerel | 6,541,100 | 64,774 | 500 | 29 |
| Kingfish | 645,600 | 15,683 | ---------- | ---------- |
| "Lingcod" | 968,200 | 41,284 | 100 | 3 |
| Mackerel | 60,832,100 | 668,092 | 104,300 | 1,285 |
| Marlin | 3,600 | 148 | 500 | 34 |
| Mullet | 8,500 | 731 | ---------- | ---------- |
| Perch | 213,000 | 9,365 | 400 | 17 |
| Pilchard or sardines | 1,071,613,300 | 6,373,233 | 100 | 1 |

[1] The catch of cod was taken off Alaska.

## *Fisheries of California, 1937*—Continued

CATCH: BY WATERS—Continued

| Species | Off California | | Off Latin America | |
|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* |
| FISH—continued | | | | |
| Pompano | 4,900 | $2,394 | 200 | $40 |
| Rock bass | 230,200 | 13,524 | 94,100 | 4,500 |
| Rockfishes | 4,131,400 | 181,670 | 159,500 | 7,814 |
| Rudderfishes | 35,600 | 1,769 | 500 | 14 |
| Sablefish | 733,600 | 29,428 | | |
| Salmon | 6,907,800 | 528,993 | | |
| Sculpin | 145,300 | 10,993 | 200 | 9 |
| Sea bass: | | | | |
| Black | 20,400 | 1,027 | 693,800 | 38,722 |
| White | 265,500 | 27,690 | 336,800 | 29,120 |
| Shad | 651,000 | 29,156 | | |
| Sheepshead | 73,100 | 2,691 | 8,300 | 307 |
| Skates | 447,500 | 8,511 | | |
| Smelt | 679,800 | 28,928 | 2,200 | 113 |
| Spanish mackerel | | | 26,700 | 1,351 |
| Splittail | 10,800 | 371 | | |
| Squawfish | 500 | 23 | | |
| Suckers | 7,900 | 219 | | |
| Swordfish | 589,900 | 80,525 | 35,400 | 4,481 |
| Tomcod | 1,100 | 35 | | |
| Tuna and tunalike fishes: | | | | |
| Albacore | 2,020,000 | 194,828 | | |
| Bluefin | 10,822,100 | 619,671 | 1,871,800 | 105,242 |
| Bonito | 5,707,200 | 208,554 | 2,100,800 | 77,728 |
| Skipjack or striped tuna | 1,884,100 | 94,208 | 45,220,000 | 2,224,315 |
| Yellowfin | 187,800 | 11,666 | 91,334,700 | 5,446,153 |
| Whitebait | 86,100 | 4,665 | | |
| Whitefish | 32,300 | 1,757 | 24,800 | 1,275 |
| Yellowtail | 223,500 | 11,300 | 5,147,500 | 200,708 |
| Other fish | 165,400 | 2,713 | 1,400 | 93 |
| Total | 1,196,676,100 | 10,121,245 | 148,894,500 | 8,252,860 |
| SHELLFISH | | | | |
| Crabs | 1,624,200 | 179,035 | | |
| Sea crawfish or spiny lobster | 385,900 | 71,991 | 936,500 | 91,668 |
| Shrimp | 1,111,700 | 16,915 | | |
| Abalone | 572,600 | 92,654 | | |
| Clams: | | | | |
| Hard | 13,200 | 2,780 | | |
| Pismo | 56,000 | 10,833 | | |
| Soft | 29,700 | 7,891 | | |
| Mussels | 200 | 17 | | |
| Octopus | 23,900 | 1,890 | | |
| Oysters, market: | | | | |
| Eastern | 67,300 | 23,047 | | |
| Japanese | 90,700 | 13,602 | | |
| Native | 5,300 | 1,768 | | |
| Squid | 501,600 | 15,380 | | |
| Total | 4,482,300 | 437,803 | 936,500 | 91,668 |
| WHALE PRODUCTS | | | | |
| Whale meat | 624,900 | 12,207 | | |
| Whale oil | 513,200 | 29,016 | | |
| Total | 1,138,100 | 41,223 | | |
| Grand total | 1,202,296,500 | 10,600,271 | 149,831,000 | 8,344,528 |

*Fisheries of the northern district of California, 1937*

OPERATING UNITS: BY GEAR

| Item | Gill nets | Lines | | Dip nets | Traps, crab | Shovels | Rakes, oyster | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| | | Set and hand | Troll | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 2 | 20 | 19 | | | | | 31 |
| On boats and shore | 14 | 89 | 225 | 24 | 41 | 13 | 3 | 263 |
| Total | 16 | 109 | 244 | 24 | 41 | 13 | 3 | 294 |
| Vessels, motor: | | | | | | | | |
| 5 to 10 tons | 1 | 10 | 13 | | | | | 17 |
| Net tonnage | 7 | 82 | 91 | | | | | 127 |
| Boats: | | | | | | | | |
| Motor | 11 | 70 | 195 | | 37 | | | 203 |
| Other | | | | | | | 3 | 3 |
| Apparatus: | | | | | | | | |
| Number | 17 | 299 | 1,083 | 24 | 703 | 13 | 3 | |
| Square yards | 12,750 | | | | | | | |
| Hooks | | 39,978 | 4,723 | | | | | |

CATCH: BY GEAR

| Species | Gill nets | | Lines | | | | Paranzella nets | |
|---|---|---|---|---|---|---|---|---|
| | | | Set and hand | | Troll | | | |
| FISH | | | | | | | | |
| Flounders: | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| "Sole" | 200 | $10 | | | | | 3,373,800 | $179,129 |
| Other | 2,300 | 86 | | | | | 367,700 | 12,863 |
| Grayfish | | | 1,700 | $99 | | | 4,700 | 47 |
| Hake | | | | | | | 700 | 8 |
| Halibut | | | 230,200 | 18,436 | 3,400 | $272 | 83,300 | 7,799 |
| Herring | 6,500 | 50 | | | | | | |
| "Lingcod" | | | 242,600 | 9,501 | 30,100 | 1,054 | 176,800 | 6,190 |
| Perch | 10,300 | 302 | | | | | | |
| Rockfishes | | | 127,400 | 4,827 | 6,100 | 214 | 321,100 | 12,753 |
| Sablefish | | | 518,400 | 20,710 | | | 52,700 | 1,585 |
| Salmon | | | | | 3,834,500 | 301,712 | | |
| Skates | | | | | | | 37,600 | 751 |
| Smelt | 8,400 | 337 | | | | | | |
| Tuna, albacore | | | | | 200 | 18 | | |
| Other fish | | | 13,100 | 342 | 1,800 | 27 | 57,200 | 695 |
| Total | 27,700 | 785 | 1,133,400 | 53,915 | 3,876,100 | 303,297 | 4,475,600 | 221,820 |
| SHELLFISH | | | | | | | | |
| Crabs | | | | | | | 500 | 40 |
| Octopus | | | 600 | 25 | | | | |
| Total | | | 600 | 25 | | | 500 | 40 |
| Grand total | 27,700 | 785 | 1,134,000 | 53,940 | 3,876,100 | 303,297 | 4,476,100 | 221,860 |

| Species | Dip nets | | Traps | | Shovels | | Rakes | |
|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Perch | 700 | $21 | | | | | | |
| Smelt | 5,300 | 168 | | | | | | |
| Whitebait | 75,800 | 3,877 | | | | | | |
| Total | 81,800 | 4,066 | | | | | | |
| SHELLFISH | | | | | | | | |
| Crabs | | | 191,300 | $15,359 | | | | |
| Clams, hard | | | | | 4,900 | $608 | | |
| Oysters, market, eastern | | | | | | | 1,200 | $266 |
| Total | | | 191,300 | 15,359 | 4,900 | 608 | 1,200 | 266 |
| Grand total | 81,800 | 4,066 | 191,300 | 15,359 | 4,900 | 608 | 1,200 | 266 |

NOTE.—The catch by paranzella nets was made by fishermen from the San Francisco district.

*Fisheries of the San Francisco district of California, 1937*

OPERATING UNITS: BY GEAR

| Item | Purse seines | | Lampara and ring nets | | Haul seines | Gill nets | |
|---|---|---|---|---|---|---|---|
| | Sardine | Tuna | Mackerel | Sardine | | Drift, salmon | Drift, sea bass |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 960 | 78 | 11 | 129 | ---- | ---- | ---- |
| On boats and shore | ---- | ---- | ---- | 23 | 15 | 210 | 11 |
| Total | 960 | 78 | 11 | 152 | 15 | 210 | 11 |
| Vessels, motor: | | | | | | | |
| 5 to 10 tons | ---- | ---- | 1 | 4 | ---- | ---- | ---- |
| 11 to 20 tons | ---- | ---- | ---- | 5 | ---- | ---- | ---- |
| 21 to 30 tons | 4 | ---- | ---- | ---- | ---- | ---- | ---- |
| 31 to 40 tons | 28 | 1 | ---- | 3 | ---- | ---- | ---- |
| 41 to 50 tons | 17 | ---- | ---- | ---- | ---- | ---- | ---- |
| 51 to 60 tons | 12 | 1 | ---- | ---- | ---- | ---- | ---- |
| 61 to 70 tons | 17 | 3 | ---- | ---- | ---- | ---- | ---- |
| 71 to 80 tons | 6 | 1 | ---- | ---- | ---- | ---- | ---- |
| 81 to 90 tons | 3 | ---- | ---- | ---- | ---- | ---- | ---- |
| 91 to 100 tons | 2 | 1 | ---- | ---- | ---- | ---- | ---- |
| Total | 89 | 7 | 1 | 12 | ---- | ---- | ---- |
| Net tonnage | 4, 619 | 471 | 9 | 217 | ---- | ---- | ---- |
| Boats: | | | | | | | |
| Motor | ---- | ---- | ---- | 3 | 4 | 113 | 6 |
| Other | ---- | ---- | ---- | ---- | 1 | 2 | 1 |
| Accessory boats | 89 | 7 | 1 | 15 | ---- | ---- | ---- |
| Apparatus: | | | | | | | |
| Number | 89 | 7 | 1 | 15 | 4 | 115 | 7 |
| Length, yards | 34, 052 | 4, 100 | 400 | 4, 425 | 580 | ---- | ---- |
| Square yards | ---- | ---- | ---- | ---- | ---- | 362, 250 | 12, 460 |

| Item | Gill nets—Contd. | | Lines | | Fyke nets | Dip nets | Bag nets, shrimp |
|---|---|---|---|---|---|---|---|
| | Drift, shad | Other | Set and hand | Troll | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | ---- | 2 | 97 | 80 | ---- | ---- | 36 |
| On boats and shore | 237 | 50 | 66 | 264 | 94 | 3 | 5 |
| Total | 237 | 52 | 163 | 344 | 94 | 3 | 41 |
| Motor: | | | | | | | |
| 5 to 10 tons | ---- | 1 | 1 | 5 | ---- | ---- | 8 |
| 11 to 20 tons | ---- | ---- | 1 | 14 | ---- | ---- | ---- |
| 21 to 30 tons | ---- | ---- | ---- | 1 | ---- | ---- | ---- |
| Total | ---- | 1 | 2 | 20 | ---- | ---- | 8 |
| Net tonnage | ---- | 6 | 23 | 267 | ---- | ---- | 48 |
| Sail: | | | | | | | |
| 321 to 330 tons | ---- | ---- | 1 | ---- | ---- | ---- | ---- |
| 491 to 500 tons | ---- | ---- | 1 | ---- | ---- | ---- | ---- |
| Total | ---- | ---- | 2 | ---- | ---- | ---- | ---- |
| Net tonnage | ---- | ---- | 824 | ---- | ---- | ---- | ---- |
| Total vessels | ---- | 1 | 4 | 20 | ---- | ---- | 8 |
| Total net tonnage | ---- | 6 | 847 | 267 | ---- | ---- | 48 |
| Boats: | | | | | | | |
| Motor | 125 | 29 | 35 | 250 | 50 | 1 | 1 |
| Other | ---- | 1 | 6 | ---- | 19 | 1 | ---- |
| Accessory boats | ---- | ---- | 74 | ---- | ---- | ---- | 4 |
| Apparatus: | | | | | | | |
| Number | 125 | 46 | 759 | 1, 266 | 1, 989 | 3 | 9 |
| Length, yards | ---- | ---- | ---- | ---- | ---- | ---- | 6, 656 |
| Square yards | 437, 000 | 56, 174 | ---- | ---- | ---- | ---- | ---- |
| Hooks | ---- | ---- | 38, 095 | 4, 484 | ---- | ---- | ---- |

*Fisheries of the San Francisco district of California, 1937*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Paranzella nets | Beam trawls | Traps, crab | Harpoons, whaling | Rakes and tongs, oyster | Shovels | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 93 | ---------- | ---------- | 16 | ---------- | ---------- | 1,293 |
| On boats and shore | ---------- | 16 | 256 | ---------- | 41 | 81 | 850 |
| Total | 93 | 16 | 256 | 16 | 41 | 81 | 2,143 |
| Vessels: | | | | | | | |
| Steam: | | | | | | | |
| 11 to 20 tons | ---------- | ---------- | ---------- | 1 | ---------- | ---------- | 1 |
| 21 to 30 tons | ---------- | ---------- | ---------- | 1 | ---------- | ---------- | 1 |
| 31 to 40 tons | 1 | ---------- | ---------- | ---------- | ---------- | ---------- | 1 |
| Total | 1 | ---------- | ---------- | 2 | ---------- | ---------- | 3 |
| Net tonnage | 32 | ---------- | ---------- | 41 | ---------- | ---------- | 73 |
| Motor: | | | | | | | |
| 5 to 10 tons | 4 | ---------- | ---------- | ---------- | ---------- | ---------- | 16 |
| 11 to 20 tons | 14 | ---------- | ---------- | ---------- | ---------- | ---------- | 19 |
| 21 to 30 tons | 1 | ---------- | ---------- | ---------- | ---------- | ---------- | 5 |
| 31 to 40 tons | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 28 |
| 41 to 50 tons | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 17 |
| 51 to 60 tons | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 12 |
| 61 to 70 tons | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 17 |
| 71 to 80 tons | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 6 |
| 81 to 90 tons | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 3 |
| 91 to 100 tons | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 2 |
| Total | 19 | ---------- | ---------- | ---------- | ---------- | ---------- | 125 |
| Net tonnage | 260 | ---------- | ---------- | ---------- | ---------- | ---------- | 5,029 |
| Sail: | | | | | | | |
| 321 to 330 tons | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 1 |
| 491 to 500 tons | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 1 |
| Total | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 2 |
| Net tonnage | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 824 |
| Total vessels | 20 | ---------- | ---------- | 2 | ---------- | ---------- | 130 |
| Total net tonnage | 292 | ---------- | ---------- | 41 | ---------- | ---------- | 5,926 |
| Boats: | | | | | | | |
| Motor | ---------- | 15 | 249 | ---------- | 17 | 11 | 521 |
| Other | ---------- | ---------- | 1 | ---------- | 19 | 2 | 47 |
| Accessory boats | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 176 |
| Apparatus: | | | | | | | |
| Number | 10 | 15 | 5,095 | 2 | 41 | 81 | ---------- |
| Yards at mouth | 167 | 100 | ---------- | ---------- | ---------- | ---------- | ---------- |

*Fisheries of the San Francisco district of California, 1937*—Continued

CATCH: BY GEAR

| Species | Purse seines | | Lampara and ring nets | | Haul seines | | Gill nets | |
|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Anchovies | | | 39, 000 | $585 | 63, 100 | $946 | | |
| Carp | | | | | 7, 600 | 114 | 4, 900 | $220 |
| Flounders: | | | | | | | | |
| "Sole" | | | 100 | 4 | | | | |
| Other | | | | | | | 600 | 17 |
| Grayfish | 10, 800 | $54 | 200 | 2 | | | 300 | 2 |
| Hardhead | | | | | 20, 800 | 1, 253 | | |
| Herring | | | 5, 000 | 37 | 335, 400 | 2, 515 | 272, 700 | 2, 046 |
| Kingfish | | | 3, 800 | 192 | | | | |
| Mackerel | | | 11, 100 | 613 | | | | |
| Perch | | | 200 | 7 | 57, 500 | 1, 895 | 40, 900 | 1, 383 |
| Pilchard or sardines | 415, 086, 300 | 2, 594, 428 | 20, 454, 700 | 132, 512 | 8, 500 | 85 | 700 | 7 |
| Rockfishes | | | | | | | 200 | 12 |
| Salmon | | | | | | | 973, 100 | 58, 740 |
| Sculpin | | | 600 | 19 | | | | |
| Sea bass, white | | | 500 | 81 | | | 11, 100 | 1, 664 |
| Shad | | | 300 | 22 | | | 650, 700 | 29, 134 |
| Smelt | | | 68, 300 | 2, 733 | 18, 400 | 792 | 231, 800 | 9, 511 |
| Splittail | | | | | 4, 900 | 49 | 100 | 7 |
| Squawfish | | | | | | | 100 | 4 |
| Suckers | | | | | 2, 800 | 38 | | |
| Tomcod | | | | | 100 | 4 | 100 | 3 |
| Whitebait | | | 300 | 22 | 100 | 10 | 100 | 9 |
| Total | 415, 097, 100 | 2, 594, 482 | 20, 584, 100 | 136, 829 | 519, 200 | 7, 701 | 2, 187, 400 | 102, 759 |
| SHELLFISH | | | | | | | | |
| Squid | | | | | | | 200 | 12 |
| Grand total | 415, 097, 100 | 2, 594, 482 | 20, 584, 100 | 136, 829 | 519, 200 | 7, 701 | 2, 187, 600 | 102, 771 |

| Species | Lines | | | | Fyke nets | | Dip nets | |
|---|---|---|---|---|---|---|---|---|
| | Set and hand | | Troll | | | | | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Carp | | | | | 23, 900 | $1, 084 | | |
| Catfish | 26, 200 | $3, 025 | | | 276, 700 | 31, 412 | | |
| Cod | 4, 731, 400 | 80, 671 | | | | | | |
| Flounders: | | | | | | | | |
| "California halibut" | 500 | 78 | 200 | $35 | | | | |
| "Sole" | 1, 800 | 88 | | | | | | |
| Other | 600 | 19 | | | | | | |
| Grayfish | 46, 100 | 297 | | | | | | |
| Hardhead | | | | | 33, 400 | 3, 641 | | |
| "Lingcod" | 211, 100 | 9, 195 | 1, 000 | 48 | | | | |
| Mackerel | 200 | 8 | 200 | 12 | | | | |
| Rockfishes | 369, 100 | 21, 306 | 100 | 5 | | | | |
| Sablefish | 1, 000 | 30 | | | | | | |
| Salmon | | | 1, 208, 200 | 89, 175 | | | | |
| Sculpin | 2, 900 | 68 | | | | | | |
| Smelt | | | | | | | 4, 300 | $255 |
| Splittail | | | | | 5, 800 | 315 | | |
| Squawfish | | | | | 400 | 19 | | |
| Suckers | | | | | 5, 100 | 181 | | |
| Tuna, albacore | | | 700 | 55 | | | | |
| Whitebait | | | | | | | 8, 200 | 580 |
| Other fish | 200 | 6 | | | | | | |
| Total | 5, 391, 100 | 114, 791 | 1, 210, 400 | 89, 330 | 345, 300 | 36, 652 | 12, 500 | 835 |
| SHELLFISH | | | | | | | | |
| Octopus | 3, 700 | 234 | | | | | | |
| Grand total | 5, 394, 800 | 115, 025 | 1, 210, 400 | 89, 330 | 345, 300 | 36, 652 | 12, 500 | 835 |

*Fisheries of the San Francisco district of California, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Bag nets | | Paranzella nets | | Beam trawls | | Traps | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| FISH | | | | | | | | |
| Flounders: | | | | | | | | |
| "California halibut" | | | 8, 200 | $1, 225 | | | | |
| "Sole" | | | 4, 401, 100 | 258, 647 | | | | |
| Other | | | 1, 120, 700 | 39, 665 | 14, 200 | $426 | | |
| Grayfish | | | 338, 900 | 1, 703 | | | | |
| Hake | | | 59, 200 | 592 | | | | |
| Herring | | | | | 300 | 3 | | |
| Kingfish | | | 1, 400 | 70 | | | | |
| "Lingcod" | | | 187, 300 | 8, 428 | | | | |
| Rockfishes | | | 323, 700 | 18, 257 | | | | |
| Sablefish | | | 19, 800 | 593 | | | | |
| Skates | | | 330, 000 | 6, 600 | | | | |
| Tomcod | | | 300 | 9 | 600 | 19 | | |
| Other fish | | | 80, 100 | 1, 201 | | | | |
| Total | | | 6, 870, 700 | 336, 990 | 15, 100 | 448 | | |
| SHELLFISH | | | | | | | | |
| Crabs | | | 44, 000 | 5, 045 | | | 1, 374, 500 | $157, 487 |
| Shrimp | 694, 900 | $10, 052 | | | 413, 800 | 6, 208 | | |
| Squid | | | 300 | 18 | | | | |
| Total | 694, 900 | 10, 052 | 44, 300 | 5, 063 | 413, 800 | 6, 208 | 1, 374, 500 | 157, 487 |
| Grand total | 694, 900 | 10, 052 | 6, 915, 000 | 342, 053 | 428, 900 | 6, 656 | 1, 374, 500 | 157, 487 |

| Species | Harpoons | | Rakes and tongs | | Shovels | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| SHELLFISH | | | | | | |
| Clams: | | | | | | |
| Hard | | | | | 1, 600 | $426 |
| Soft | | | | | 29, 700 | 7, 891 |
| Oysters, market: | | | | | | |
| Eastern | | | 66, 100 | $22, 781 | | |
| Japanese | | | 90, 700 | 13, 602 | | |
| Native | | | 5, 300 | 1, 768 | | |
| Total | | | 162, 100 | 38, 151 | 31, 300 | 8, 317 |
| WHALE PRODUCTS | | | | | | |
| Whale meat | 624, 900 | $12, 207 | | | | |
| Whale oil | 513, 200 | 29, 016 | | | | |
| Total | 1, 138, 100 | 41, 223 | | | | |
| Grand total | 1, 138, 100 | 41, 223 | 162, 100 | 38, 151 | 31, 300 | 8, 317 |

*Fisheries of the Monterey district of California, 1937*

OPERATING UNITS: BY GEAR

| Item | Purse seines | | | Lampara and ring nets | | | Gill nets | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mackerel | Sardine | Tuna | Mackerel | Sardine | Other | Set, "California halibut" | Set, crab | Drift, sea bass |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 22 | 564 | 126 | 12 | 138 | 39 | | | |
| On boats and shore | | | | | 133 | 76 | 24 | 14 | 15 |
| Total | 22 | 564 | 126 | 12 | 271 | 115 | 24 | 14 | 15 |
| Vessels, motor: | | | | | | | | | |
| 5 to 10 tons | | | | 1 | 10 | 5 | | | |
| 11 to 20 tons | | | | | 1 | | | | |
| 21 to 30 tons | | 1 | | | | | | | |
| 31 to 40 tons | | 2 | | | 1 | | | | |
| 41 to 50 tons | 1 | 9 | 2 | | | | | | |
| 51 to 60 tons | | 19 | 4 | | | | | | |
| 61 to 70 tons | 1 | 9 | 3 | | | | | | |
| 71 to 80 tons | | 9 | 2 | | | | | | |
| 81 to 90 tons | | 1 | | | | | | | |
| Total | 2 | 50 | 11 | 1 | 12 | 5 | | | |
| Net tonnage | 112 | 2,908 | 659 | 9 | 120 | 31 | | | |
| Boats: | | | | | | | | | |
| Motor | | | | | 12 | 12 | 13 | 10 | 12 |
| Other | | | | | | | 1 | | |
| Accessory boats | 2 | 50 | 11 | 1 | 24 | 17 | | | |
| Apparatus: | | | | | | | | | |
| Number | 2 | 50 | 11 | 1 | 24 | 17 | 14 | 10 | 12 |
| Length, yards | 1,200 | 18,385 | 6,352 | 440 | 6,487 | 3,230 | | | |
| Square yards | | | | | | | 33,796 | 33,600 | 24,000 |

| Item | Gill nets—Contd. | Lines | | Otter trawls | Traps, octopus | Rakes and tongs, other than for oysters | Shovels | Abalone outfits | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|
| | Other | Set and hand | Troll | | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | 40 | 16 | | | | 58 | 729 |
| On boats and shore | 35 | 208 | 250 | 10 | 4 | 4 | 26 | 11 | 458 |
| Total | 35 | 208 | 290 | 26 | 4 | 4 | 26 | 69 | 1,187 |
| Vessels, motor: | | | | | | | | | |
| 5 to 10 tons | | | 13 | 3 | | | | 11 | 19 |
| 11 to 20 tons | | | 1 | | | | | 1 | 1 |
| 21 to 30 tons | | | | | | | | | 1 |
| 31 to 40 tons | | | 1 | | | | | | 2 |
| 41 to 50 tons | | | | 1 | | | | | 9 |
| 51 to 60 tons | | | | | | | | | 19 |
| 61 to 70 tons | | | | | | | | | 9 |
| 71 to 80 tons | | | | | | | | | 9 |
| 81 to 90 tons | | | | | | | | | 1 |
| Total | | | 15 | 4 | | | | 12 | 70 |
| Net tonnage | | | 148 | 70 | | | | 93 | 3,055 |
| Boats: | | | | | | | | | |
| Motor | 15 | 150 | 196 | 3 | 3 | 4 | 7 | 2 | 209 |
| Other | 8 | 14 | | | | | 6 | | 24 |
| Accessory boats | | | | | | | | | 61 |
| Apparatus: | | | | | | | | | |
| Number | 33 | 766 | 1,500 | 7 | 100 | 4 | 26 | 14 | |
| Square yards | 43,915 | | | | | | | | |
| Yards at mouth | | | | 78 | | | | | |
| Hooks | | 80,268 | 3,846 | | | | | | |

*Fisheries of the Monterey district of California, 1937*—Continued

CATCH: BY GEAR

| Species | Purse seines | | Lampara and ring nets | | Gill nets | |
|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Anchovies | 10,000 | $200 | 34,200 | $654 | | |
| Flounders: | | | | | | |
| "California halibut" | | | 400 | 48 | 8,900 | $984 |
| "Sole" | | | 400 | 20 | 8,400 | 420 |
| Other | | | | | 5,300 | 167 |
| Grayfish | 12,800 | 131 | 5,000 | 51 | 10,400 | 106 |
| Herring | | | 3,600 | 54 | 700 | 11 |
| Horse mackerel | 700 | 48 | 37,600 | 2,561 | 3,700 | 251 |
| Kingfish | | | 57,700 | 2,252 | 68,000 | 2,653 |
| "Lingcod" | | | | | 1,500 | 86 |
| Mackerel | 322,500 | 3,225 | 1,095,700 | 16,743 | 300 | 12 |
| Perch | | | 24,100 | 1,074 | 11,500 | 512 |
| Pilchard or sardines | 259,041,500 | 1,566,217 | 20,139,600 | 128,025 | 13,200 | 132 |
| Pompano | | | 100 | 47 | | |
| Rockfishes | 1,400 | 56 | | | 3,300 | 130 |
| Sablefish | | | | | 100 | 2 |
| Sculpin | | | | | 500 | 6 |
| Sea bass: | | | | | | |
| Black | | | | | 100 | 5 |
| White | 400 | 42 | 2,300 | 242 | 25,400 | 2,675 |
| Skates | | | 100 | 2 | 4,800 | 95 |
| Smelt | | | 11,100 | 582 | 70,600 | 3,754 |
| Tuna and tunalike fishes, bonito | | | 200 | 10 | 100 | 5 |
| Whitebait | | | 1,600 | 167 | | |
| Other fish | | | | | 100 | 3 |
| Total | 259,389,300 | 1,569,919 | 21,413,700 | 152,532 | 236,900 | 12,009 |
| SHELLFISH | | | | | | |
| Crabs | | | | | 12,100 | 1,040 |
| Squid | | | 464,700 | 14,142 | | |
| Total | | | 464,700 | 14,142 | 12,100 | 1,040 |
| Grand total | 259,389,300 | 1,569,919 | 21,878,400 | 166,674 | 249,000 | 13,049 |

| Species | Lines | | | | Otter trawls and paranzella nets [1] | |
|---|---|---|---|---|---|---|
| | Set and hand | | Troll | | | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders: | | | | | | |
| "California halibut" | 900 | $102 | 200 | $22 | 8,600 | $948 |
| "Sole" | 12,800 | 640 | | | 203,400 | 9,705 |
| Other | 12,800 | 642 | | | 34,400 | 1,313 |
| Grayfish | 19,700 | 201 | 200 | 2 | 79,700 | 814 |
| Hake | | | | | 1,200 | 12 |
| Horse mackerel | 200 | 14 | | | | |
| Kingfish | 4,200 | 164 | | | 4,900 | 191 |
| "Lingcod" | 112,600 | 6,489 | 600 | 34 | 2,800 | 161 |
| Mackerel | 600,900 | 24,036 | | | 100 | 4 |
| Perch | 1,900 | 85 | | | 2,400 | 107 |
| Rockfishes | 2,096,400 | 84,928 | 500 | 20 | 26,300 | 1,430 |
| Sablefish | 4,100 | 91 | | | | |
| Salmon | | | 891,100 | 79,328 | | |
| Sculpin | 3,900 | 52 | | | | |
| Sea bass, white | 100 | 10 | | | | |
| Skates | 1,000 | 20 | | | 15,500 | 307 |
| Smelt | 10,200 | 529 | | | | |
| Tuna, albacore | | | 582,700 | 50,985 | | |
| Other fish | 200 | 5 | | | 2,300 | 52 |
| Total | 2,881,900 | 118,008 | 1,475,300 | 130,391 | 381,600 | 15,044 |
| SHELLFISH | | | | | | |
| Crabs | | | | | 200 | 16 |
| Octopus | 8,500 | 685 | | | 400 | 33 |
| Total | 8,500 | 685 | | | 600 | 49 |
| Grand total | 2,890,400 | 118,693 | 1,475,300 | 130,391 | 382,200 | 15,093 |

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[1] The catch by paranzella nets was made by fishermen from the San Francisco district.

## *Fisheries of the Monterey district of California, 1937*—Continued

### CATCH: By gear—Continued

| Species | Traps | | Rakes and tongs | | Shovels | | Abalone outfits | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| SHELLFISH | | | | | | | | |
| Shrimp | 3,000 | $655 | | | | | | |
| Abalone | | | | | | | 286,600 | $63,261 |
| Clams, Pismo | | | | | 3,500 | $866 | | |
| Mussels | | | 200 | $17 | | | | |
| Octopus | 10,300 | 869 | | | | | | |
| Total | 13,300 | 1,524 | 200 | 17 | 3,500 | 866 | 286,600 | 63,261 |

## *Fisheries of the San Pedro district of California, 1937*

### OPERATING UNITS: By gear

| Item | Purse seines | | | Lampara and ring nets | | | Gill nets | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mackerel | Sardine | Tuna | Mackerel | Sardine | Other | Drift, barracuda | Set, sea bass | Other |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 132 | 1,175 | 927 | 651 | 867 | 94 | 3 | 3 | 10 |
| On boats and shore | | | | | 10 | 24 | 12 | 27 | 25 |
| Total | 132 | 1,175 | 927 | 651 | 877 | 118 | 15 | 30 | 35 |
| Vessels, motor: | | | | | | | | | |
| 5 to 10 tons | | | | | 4 | 3 | 1 | 1 | 3 |
| 11 to 20 tons | 1 | 1 | | 7 | 14 | 2 | | | 1 |
| 21 to 30 tons | 8 | 24 | 13 | 18 | 20 | | | | |
| 31 to 40 tons | 1 | 21 | 14 | 18 | 22 | 3 | | | |
| 41 to 50 tons | 2 | 8 | 6 | 6 | 8 | | | | |
| 51 to 60 tons | | 31 | 31 | 6 | 8 | | | | |
| 61 to 70 tons | | 14 | 11 | 1 | | | | | |
| 71 to 80 tons | | 7 | 6 | | | | | | |
| 81 to 90 tons | | 1 | 1 | | | | | | |
| 91 to 100 tons | | | 1 | | | | | | |
| 171 to 180 tons | | | 1 | | | | | | |
| Total vessels | 12 | 107 | 84 | 56 | 76 | 8 | 1 | 1 | 4 |
| Total net tonnage | 348 | 5,005 | 4,353 | 1,877 | 2,315 | 157 | 6 | 6 | 38 |
| Boats: | | | | | | | | | |
| Motor | | | | | 1 | 5 | 4 | 11 | 12 |
| Other | | | | | | | | 1 | 5 |
| Accessory boats | 12 | 107 | 84 | 56 | 77 | 13 | | | |
| Apparatus: | | | | | | | | | |
| Number | 12 | 107 | 84 | 56 | 77 | 13 | 5 | 13 | 21 |
| Length, yards | 5,537 | 41,457 | 49,783 | 28,438 | 37,768 | 6,162 | | | |
| Square yards | | | | | | | 45,000 | 41,600 | 18,700 |

## *Fisheries of the San Pedro district of California, 1937*—Continued

### OPERATING UNITS: By gear—Continued

| Item | Trammel nets | Lines | | Paranzella nets | Traps, sea crawfish | Harpoons, swordfish | Shovels | Abalone outfits | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|
| | | Set and hand | Troll | | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 11 | 475 | 17 | 9 | 13 | 18 | | 5 | 2,336 |
| On boats and shore | 50 | 596 | 368 | 24 | 176 | 105 | 63 | 30 | 838 |
| Total | 61 | 1,071 | 385 | 33 | 189 | 123 | 63 | 35 | 3,174 |
| Vessels, motor: | | | | | | | | | |
| 5 to 10 tons | 3 | 32 | 7 | 1 | 3 | 5 | | 1 | 45 |
| 11 to 20 tons | | 17 | | 1 | 2 | 1 | | | 23 |
| 21 to 30 tons | 1 | 5 | 1 | | | | | | 43 |
| 31 to 40 tons | | | | | | | | | 35 |
| 41 to 50 tons | | 1 | | | | | | | 16 |
| 51 to 60 tons | | | | | | | | | 39 |
| 61 to 70 tons | | 1 | | | | | | | 15 |
| 71 to 80 tons | | | | | | | | | 7 |
| 81 to 90 tons | | | | | | | | | 1 |
| 91 to 100 tons | | 2 | | | | | | | 3 |
| 111 to 120 tons | | 4 | | | | | | | 4 |
| 121 to 130 tons | | 1 | | | | | | | 1 |
| 131 to 140 tons | | 1 | | | | | | | 1 |
| 141 to 150 tons | | 1 | | | | | | | 1 |
| 161 to 170 tons | | 1 | | | | | | | 1 |
| 171 to 180 tons | | | | | | | | | 1 |
| 181 to 190 tons | | 1 | | | | | | | 1 |
| 201 to 210 tons | | 2 | | | | | | | 2 |
| 361 to 370 tons | | 1 | | | | | | | 1 |
| Total vessels | 4 | 70 | 8 | 2 | 5 | 6 | | 1 | 240 |
| Total net tonnage | 43 | 2,898 | 76 | 26 | 58 | 43 | | 9 | 9,950 |
| Boats: | | | | | | | | | |
| Motor | 18 | 322 | 261 | 6 | 99 | 46 | 2 | 9 | 432 |
| Other | | 16 | | | 23 | | 13 | | 45 |
| Accessory boats | | 79 | | | | | | | 232 |
| Apparatus: | | | | | | | | | |
| Number | 22 | 1,946 | 1,580 | 4 | 4,940 | 52 | 63 | 10 | |
| Square yards | 93,432 | | | | | | | | |
| Yards at mouth | | | | 67 | | | | | |
| Hooks | | 288,041 | 1,612 | | | | | | |

### CATCH OFF CALIFORNIA: By gear

| Species | Purse seines | | Lampara and ring nets | | Gill nets | | Trammel nets | |
|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Anchovies | | | 79,900 | $854 | | | | |
| Barracuda | 131,100 | $7,065 | 221,500 | 11,936 | 36,600 | $1,972 | | |
| Flounders: | | | | | | | | |
| "California halibut" | | | 600 | 53 | 100 | 9 | 403,000 | $35,598 |
| "Sole" | | | 400 | 12 | | | 1,200 | 36 |
| Flyingfish | | | 200 | 9 | 41,700 | 1,825 | | |
| Grayfish | 1,100 | 37 | 4,200 | 142 | 31,500 | 1,063 | 78,800 | 2,660 |
| Horse mackerel | 1,652,500 | 15,735 | 4,746,900 | 45,199 | 900 | 9 | | |
| Kingfish | | | 440,900 | 8,856 | 3,000 | 60 | | |
| Mackerel | 7,858,700 | 82,516 | 38,705,400 | 406,407 | 12,700 | 141 | | |
| Mullet | | | | | 3,000 | 294 | | |
| Perch | 900 | 58 | 47,500 | 3,050 | 8,200 | 527 | | |
| Pilchard or sardines | 177,856,500 | 970,249 | 169,603,300 | 932,946 | 1,300 | 13 | | |
| Pompano | | | 4,200 | 2,082 | 500 | 248 | | |
| Rock bass | | | 400 | 28 | 4,500 | 319 | 3,300 | 234 |
| Rockfishes | | | 400 | 17 | 100 | 4 | 1,900 | 82 |
| Butterfishes | | | 34,500 | 1,719 | 300 | 15 | | |
| Sculpin | | | 100 | 8 | | | 100 | 8 |
| Sea bass: | | | | | | | | |
| Black | 200 | 10 | 300 | 15 | 900 | 46 | 1,500 | 76 |
| White | 14,200 | 1,626 | 20,200 | 2,313 | 88,500 | 10,020 | 1,500 | 172 |
| Sheepshead | | | | | 200 | 7 | 3,600 | 132 |
| Skates | | | | | | | 11,400 | 144 |
| Smelt | 300 | 12 | 220,300 | 8,976 | 22,900 | 933 | | |
| Swordfish | 200 | 28 | | | | | | |

*Fisheries of the San Pedro district of California, 1937*—Continued

CATCH OFF CALIFORNIA: BY GEAR—Continued

| Species | Purse seines | | Lampara and ring nets | | Gill nets | | Trammel nets | |
|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Tuna and tunalike fishes: | | | | | | | | |
| Albacore | 45,600 | $4,560 | 39,000 | $3,900 | ------- | ------- | 100 | $10 |
| Bluefin | 6,387,400 | 366,179 | 3,578,300 | 205,387 | 100 | $6 | ------- | ------- |
| Bonito | 1,260,200 | 47,154 | 2,848,900 | 106,601 | 3,100 | 116 | 900 | 34 |
| Skipjack or striped tuna | 1,600 | 80 | 900 | 45 | ------- | ------- | ------- | ------- |
| Yellowfin | 64,700 | 4,031 | 7,600 | 473 | ------- | ------- | ------- | ------- |
| Whitefish | ------- | ------- | ------- | ------- | ------- | ------- | 100 | 6 |
| Yellowtail | 81,800 | 4,224 | 23,600 | 1,219 | 100 | 5 | ------- | ------- |
| Other fish | 100 | 4 | 1,400 | 52 | 500 | 19 | 300 | 11 |
| Total | 195,357,100 | 1,503,568 | 220,630,900 | 1,742,299 | 260,700 | 17,651 | 507,700 | 39,203 |
| SHELLFISH | | | | | | | | |
| Sea crawfish or spiny lobster | ------- | ------- | ------- | ------- | ------- | ------- | 5,200 | 972 |
| Squid | 200 | 7 | 36,200 | 1,201 | ------- | ------- | ------- | ------- |
| Total | 200 | 7 | 36,200 | 1,201 | ------- | ------- | 5,200 | 972 |
| Grand total | 195,357,300 | 1,503,575 | 220,667,100 | 1,743,500 | 260,700 | 17,651 | 512,900 | 40,175 |

| Species | Lines | | | | Paranzella nets | | Traps | |
|---|---|---|---|---|---|---|---|---|
| | Set and hand | | Troll | | | | | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Barracuda | 356,900 | $19,232 | 672,300 | $36,229 | ------- | ------- | ------- | ------- |
| Flounders: | | | | | | | | |
| "California halibut" | 38,800 | 3,427 | 100 | 9 | 209,500 | $18,506 | ------- | ------- |
| "Sole" | 2,400 | 72 | ------- | ------- | 296,200 | 8,831 | ------- | ------- |
| Other | 8,200 | 1,300 | ------- | ------- | 100 | 8 | ------- | ------- |
| Grayfish | 185,700 | 6,270 | 1,000 | 34 | 3,200 | 108 | ------- | ------- |
| Hake | 2,300 | 56 | ------- | ------- | ------- | ------- | ------- | ------- |
| Horse mackerel | 500 | 5 | ------- | ------- | ------- | ------- | ------- | ------- |
| Kingfish | 60,800 | 1,222 | ------- | ------- | 100 | 2 | 100 | $2 |
| "Lingcod" | 1,800 | 98 | ------- | ------- | ------- | ------- | ------- | ------- |
| Mackerel | 8,927,100 | 98,719 | 1,300 | 15 | ------- | ------- | ------- | ------- |
| Marlin | 2,600 | 107 | ------- | ------- | ------- | ------- | ------- | ------- |
| Perch | 3,600 | 231 | ------- | ------- | ------- | ------- | 1,200 | 77 |
| Rock bass | 79,200 | 5,613 | 300 | 21 | ------- | ------- | 29,400 | 2,084 |
| Rockfishes | 707,900 | 30,594 | ------- | ------- | 1,100 | 48 | 800 | 35 |
| Rudderfishes | 600 | 30 | ------- | ------- | ------- | ------- | ------- | ------- |
| Sablefish | 137,300 | 6,412 | ------- | ------- | ------- | ------- | ------- | ------- |
| Salmon | ------- | ------- | 900 | 38 | ------- | ------- | ------- | ------- |
| Sculpin | 124,700 | 10,012 | ------- | ------- | ------- | ------- | 3,500 | 281 |
| Sea bass: | | | | | | | | |
| Black | 14,000 | 716 | ------- | ------- | 200 | 10 | ------- | ------- |
| White | 13,800 | 1,695 | ------- | ------- | ------- | ------- | ------- | ------- |
| Sheepshead | 13,700 | 502 | ------- | ------- | ------- | ------- | 52,700 | 1,930 |
| Skates | 4,300 | 54 | ------- | ------- | 41,400 | 524 | ------- | ------- |
| Smelt | 5,500 | 224 | ------- | ------- | ------- | ------- | ------- | ------- |
| Tuna and tunalike fishes: | | | | | | | | |
| Albacore | 626,000 | 62,650 | 399,300 | 39,962 | ------- | ------- | ------- | ------- |
| Bluefin | 4,800 | 276 | 7,500 | 430 | ------- | ------- | ------- | ------- |
| Bonito | 52,400 | 1,961 | 139,900 | 5,235 | ------- | ------- | ------- | ------- |
| Skipjack or striped tuna | 570,300 | 28,516 | 2,600 | 130 | ------- | ------- | ------- | ------- |
| Yellowfin | 74,800 | 4,661 | 8,400 | 523 | ------- | ------- | ------- | ------- |
| Whitefish | 23,600 | 1,312 | ------- | ------- | ------- | ------- | 2,400 | 134 |
| Yellowtail | 13,900 | 718 | 5,600 | 289 | ------- | ------- | ------- | ------- |
| Other fish | 5,200 | 195 | 200 | 7 | ------- | ------- | 2,200 | 82 |
| Total | 12,062,700 | 286,880 | 1,239,400 | 82,922 | 551,800 | 28,037 | 92,300 | 4,625 |
| SHELLFISH | | | | | | | | |
| Crabs | ------- | ------- | ------- | ------- | ------- | ------- | 1,600 | 48 |
| Sea crawfish or spiny lobster | ------- | ------- | ------- | ------- | ------- | ------- | 304,400 | 56,904 |
| Octopus | 300 | 33 | ------- | ------- | ------- | ------- | 100 | 11 |
| Total | 300 | 33 | ------- | ------- | ------- | ------- | 306,100 | 56,963 |
| Grand total | 12,063,000 | 286,913 | 1,239,400 | 82,922 | 551,800 | 28,037 | 398,400 | 61,588 |

### *Fisheries of the San Pedro district of California*—Continued

CATCH OFF CALIFORNIA: BY GEAR—Continued

| Species | Harpoons | | Shovels | | Abalone outfits | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| FISH | | | | | | |
| Marlin | 1,000 | $41 | | | | |
| Swordfish | 398,100 | 56,544 | | | | |
| Total | 399,100 | 56,585 | | | | |
| SHELLFISH | | | | | | |
| Abalone | | | | | 286,000 | $29,393 |
| Clams: | | | | | | |
| Hard | | | 6,700 | $1,746 | | |
| Pismo | | | 52,500 | 9,967 | | |
| Total | | | 59,200 | 11,713 | 286,000 | 29,393 |
| Grand total | 399,100 | 56,585 | 59,200 | 11,713 | 286,000 | 29,393 |

CATCH OFF LATIN AMERICA: BY GEAR

| Species | Purse seines | | Gill nets | | Trammel nets | | Lines, set and hand | | Traps | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| FISH | | | | | | | | | | |
| Barracuda | 357,300 | $26,031 | | | | | 96,100 | $7,001 | | |
| Cabrillo | | | | | | | 59,700 | 3,359 | | |
| Flounders, "California halibut" | | | | | 26,800 | $2,412 | 1,000 | 90 | | |
| Grayfish | | | | | 800 | 33 | 1,200 | 50 | | |
| Groupers | | | | | | | 4,500 | 300 | | |
| Horse mackerel | | | | | | | 500 | 29 | | |
| Marlin | | | | | | | 500 | 34 | | |
| Rock bass | | | | | | | 19,400 | 1,271 | | |
| Sea bass: | | | | | | | | | | |
| Black | 200 | 12 | 1,000 | $58 | | | 455,600 | 26,657 | | |
| White | 100 | 9 | 8,600 | 800 | 200 | 19 | 2,500 | 232 | | |
| Sheepshead | | | | | 100 | 4 | 1,200 | 52 | | |
| Spanish mackerel | | | | | | | 19,000 | 1,077 | | |
| Tuna and tunalike fishes: | | | | | | | | | | |
| Bluefin | 1,316,000 | 73,542 | | | | | 700 | 49 | | |
| Bonito | 786,400 | 29,485 | | | | | 79,200 | 2,969 | | |
| Skipjack or striped tuna | 6,402,200 | 318,938 | | | | | 8,606,500 | 428,759 | | |
| Yellowfin | 8,542,800 | 508,672 | | | | | 17,418,700 | 1,037,180 | | |
| Whitefish | | | | | | | 3,900 | 215 | | |
| Yellowtail | 253,300 | 10,283 | | | | | 166,100 | 6,743 | | |
| Other fish | | | | | | | 1,400 | 93 | | |
| Total | 17,658,300 | 966,972 | 9,600 | 858 | 27,900 | 2,468 | 26,937,700 | 1,516,160 | | |
| SHELLFISH | | | | | | | | | | |
| Sea crawfish or spiny lobster | | | | | | | | | 1,500 | $304 |
| Grand total | 17,658,300 | 966,972 | 9,600 | 858 | 27,900 | 2,468 | 26,937,700 | 1,516,160 | 1,500 | 304 |

### *Fisheries of the San Diego district of California, 1937*

OPERATING UNITS: BY GEAR

| Item | Lampara and ring nets | | | Gill nets | | |
|---|---|---|---|---|---|---|
| | Mackerel | Sardine | Other | Drift, barracuda | Set, sea bass | Other |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | |
| On vessels | 100 | 174 | 20 | ----- | 3 | ----- |
| On boats and shore | ----- | 29 | ----- | 14 | 24 | 7 |
| Total | 100 | 203 | 20 | 14 | 27 | 7 |
| Vessels, motor: | | | | | | |
| 5 to 10 tons | 7 | 11 | 1 | ----- | 1 | ----- |
| 11 to 20 tons | 2 | 4 | ----- | ----- | ----- | ----- |
| 21 to 30 tons | ----- | ----- | 1 | ----- | ----- | ----- |
| Total | 9 | 15 | 2 | ----- | 1 | ----- |
| Net tonnage | 77 | 129 | 29 | ----- | 5 | ----- |
| Boats: | | | | | | |
| Motor | ----- | 3 | ----- | 5 | 8 | 3 |
| Other | ----- | ----- | ----- | ----- | ----- | 1 |
| Accessory boats | 9 | 18 | 2 | ----- | ----- | ----- |
| Apparatus: | | | | | | |
| Number | 9 | 18 | 2 | 5 | 9 | 4 |
| Length, yards | 3, 150 | 4, 421 | 1, 000 | ----- | ----- | ----- |
| Square yards | ----- | ----- | ----- | 15, 000 | 43, 942 | 6, 080 |

| Item | Trammel nets | Lines | | Traps, sea crawfish | Harpoons, swordfish | Total, exclusive of, duplication |
|---|---|---|---|---|---|---|
| | | Set and hand | Troll | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | |
| On vessels | 3 | 974 | 13 | ----- | 23 | 1, 059 |
| On boats and shore | 25 | 163 | 118 | 34 | 27 | 249 |
| Total | 28 | 1, 137 | 131 | 34 | 50 | 1, 308 |
| Vessels, motor: | | | | | | |
| 5 to 10 tons | 1 | 24 | 5 | ----- | 3 | 30 |
| 11 to 20 tons | ----- | 16 | ----- | ----- | 3 | 16 |
| 21 to 30 tons | ----- | 5 | ----- | ----- | ----- | 5 |
| 31 to 40 tons | ----- | 8 | ----- | ----- | ----- | 8 |
| 41 to 50 tons | ----- | 3 | ----- | ----- | ----- | 3 |
| 51 to 60 tons | ----- | 2 | ----- | ----- | ----- | 2 |
| 61 to 70 tons | ----- | 1 | ----- | ----- | ----- | 1 |
| 71 to 80 tons | ----- | 7 | ----- | ----- | ----- | 7 |
| 81 to 90 tons | ----- | 4 | ----- | ----- | ----- | 4 |
| 91 to 100 tons | ----- | 2 | ----- | ----- | ----- | 2 |
| 101 to 110 tons | ----- | 2 | ----- | ----- | ----- | 2 |
| 111 to 120 tons | ----- | 5 | ----- | ----- | ----- | 5 |
| 121 to 130 tons | ----- | 4 | ----- | ----- | ----- | 4 |
| 131 to 140 tons | ----- | 7 | ----- | ----- | ----- | 7 |
| 141 to 150 tons | ----- | 2 | ----- | ----- | ----- | 2 |
| 151 to 160 tons | ----- | 2 | ----- | ----- | ----- | 2 |
| 161 to 170 tons | ----- | 1 | ----- | ----- | ----- | 1 |
| 171 to 180 tons | ----- | 1 | ----- | ----- | ----- | 1 |
| 181 to 190 tons | ----- | 2 | ----- | ----- | ----- | 2 |
| 191 to 200 tons | ----- | 3 | ----- | ----- | ----- | 3 |
| 291 to 300 tons | ----- | 1 | ----- | ----- | ----- | 1 |
| Total | 1 | 102 | 5 | ----- | 6 | 108 |
| Net tonnage | 5 | 6, 627 | 40 | ----- | 67 | 6, 674 |
| Boats: | | | | | | |
| Motor | 8 | 77 | 81 | 24 | 9 | 121 |
| Other | ----- | ----- | ----- | 1 | ----- | 2 |
| Accessory boats | ----- | 101 | ----- | ----- | ----- | 106 |
| Apparatus: | | | | | | |
| Number | 9 | 1, 289 | 560 | 781 | 15 | ----- |
| Square yards | 86, 665 | ----- | ----- | ----- | ----- | ----- |
| Hooks | ----- | 36, 903 | 560 | ----- | ----- | ----- |

*Fisheries of the San Diego district of California, 1937*—Continued

CATCH OFF CALIFORNIA: BY GEAR

| Species | Purse seines | | Lampara and ring nets | | Gill nets | | Trammel nets | |
|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Barracuda | 22,100 | $930 | 76,900 | $3,234 | 31,700 | $1,333 | | |
| Flounders, "California halibut" | | | 200 | 15 | | | 128,300 | $9,696 |
| Grayfish | | | | | 1,700 | 24 | 53,000 | 740 |
| Herring | | | | | 7,100 | 61 | | |
| Horse mackerel | 21,400 | 208 | 76,700 | 744 | | | | |
| Mackerel | 102,800 | 1,079 | 2,265,700 | 23,790 | 5,800 | 116 | 200 | 4 |
| Mullet | | | | | 5,500 | 437 | | |
| Perch | | | 2,100 | 36 | | | | |
| Pilchard or sardines | 425,100 | 2,197 | 8,982,600 | 46,422 | | | | |
| Pompano | | | 100 | 17 | | | | |
| Rockfishes | | | 200 | 10 | | | 700 | 34 |
| Sea bass: | | | | | | | | |
| Black | | | | | 900 | 42 | 400 | 19 |
| White | | | 43,200 | 3,530 | 15,600 | 1,275 | 700 | 57 |
| Smelt | | | 700 | 35 | 400 | 20 | | |
| Tuna and tunalike fishes: | | | | | | | | |
| Albacore | | | 2,300 | 230 | | | | |
| Bluefin | 181,800 | 10,208 | 587,100 | 32,968 | | | | |
| Bonito | 100,400 | 3,398 | 830,100 | 28,097 | 600 | 20 | 1,800 | 61 |
| Skipjack or striped tuna | 15,600 | 780 | 500 | 25 | | | | |
| Yellowfin | 100 | 6 | | | | | | |
| Yellowtail | 1,600 | 79 | 16,400 | 807 | 100 | 5 | 200 | 10 |
| Total | 870,900 | 18,885 | 12,884,800 | 139,960 | 69,400 | 3,333 | 185,300 | 10,621 |

| Species | Lines | | | | Traps | | Harpoons | |
|---|---|---|---|---|---|---|---|---|
| | Set and hand | | Troll | | | | | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Barracuda | 179,300 | $7,543 | 65,200 | $2,742 | | | | |
| Flounders, "California halibut" | 3,700 | 280 | | | | | | |
| Grayfish | 14,700 | 206 | 900 | 13 | | | | |
| Groupers | 100 | 4 | | | | | | |
| Kingfish | 700 | 19 | | | | | | |
| Mackerel | 921,400 | 10,652 | | | | | | |
| Rock bass | 75,900 | 3,506 | 100 | 5 | 37,100 | $1,714 | | |
| Rockfishes | 142,700 | 6,908 | | | | | | |
| Rudderfishes | 200 | 5 | | | | | | |
| Sablefish | 200 | 5 | | | | | | |
| Sculpin | 9,000 | 539 | | | | | | |
| Sea bass: | | | | | | | | |
| Black | 1,900 | 88 | | | | | | |
| White | 27,900 | 2,280 | 100 | 8 | | | | |
| Sheepshead | 1,200 | 50 | | | 1,700 | 70 | | |
| Skates | 1,400 | 14 | | | | | | |
| Smelt | 1,300 | 67 | | | | | | |
| Swordfish | | | | | | | 191,600 | $23,953 |
| Tuna and tunalike fishes: | | | | | | | | |
| Albacore | 132,300 | 13,250 | 191,800 | 19,208 | | | | |
| Bluefin | 70,100 | 3,936 | 5,000 | 281 | | | | |
| Bonito | 288,400 | 9,763 | 180,200 | 6,099 | | | | |
| Skipjack or striped tuna | 1,287,400 | 64,372 | 5,200 | 260 | | | | |
| Yellowfin | 29,200 | 1,792 | 3,000 | 180 | | | | |
| Whitefish | 6,200 | 305 | | | | | | |
| Yellowtail | 66,800 | 3,285 | 13,400 | 659 | | | | |
| Other fish | 500 | 12 | | | | | | |
| Total | 3,262,500 | 128,881 | 464,900 | 29,455 | 38,800 | 1,784 | 191,600 | 23,953 |
| SHELLFISH | | | | | | | | |
| Sea crawfish or spiny lobster | | | | | 76,300 | 14,115 | | |
| Grand total | 3,262,500 | 128,881 | 464,900 | 29,455 | 115,100 | 15,899 | 191,600 | 23,953 |

*Fisheries of the San Diego district of California, 1937*—Continued

CATCH OFF LATIN AMERICA: BY GEAR

| Species | Purse seines | | Lampara and ring nets | | Gill nets | | Trammel nets | |
|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Barracuda | 89,200 | $4,586 | 42,500 | $2,185 | 33,800 | $1,738 | -------- | -------- |
| Flounders, "California halibut" | -------- | -------- | -------- | -------- | -------- | -------- | 366,600 | $28,675 |
| Grayfish | -------- | -------- | -------- | -------- | 1,900 | 48 | 1,300 | 32 |
| Groupers | -------- | -------- | -------- | -------- | 300 | 15 | -------- | -------- |
| Mackerel | -------- | -------- | 34,900 | 430 | 4,700 | 58 | -------- | -------- |
| Perch | -------- | -------- | 300 | 13 | -------- | -------- | -------- | -------- |
| Pilchard or sardines | -------- | -------- | 100 | 1 | -------- | -------- | -------- | -------- |
| Pompano | -------- | -------- | 200 | 40 | -------- | -------- | -------- | -------- |
| Rock bass | -------- | -------- | -------- | -------- | 1,000 | 43 | -------- | -------- |
| Rockfishes | -------- | -------- | -------- | -------- | 100 | 5 | 300 | 15 |
| Sea bass: | | | | | | | | |
| Black | 15,200 | 769 | -------- | -------- | 5,100 | 258 | 3,000 | 152 |
| White | -------- | -------- | 60,100 | 5,183 | 113,500 | 9,787 | 700 | 60 |
| Sheepshead | -------- | -------- | -------- | -------- | -------- | -------- | 400 | 14 |
| Smelt | -------- | -------- | 1,700 | 87 | 400 | 21 | -------- | -------- |
| Tuna and tunalike fishes: | | | | | | | | |
| Bluefin | -------- | -------- | 470,100 | 26,805 | -------- | -------- | -------- | -------- |
| Bonito | 5,700 | 209 | 245,100 | 8,984 | 10,100 | 370 | 1,100 | 40 |
| Skipjack or striped tuna | 102,300 | 5,115 | -------- | -------- | -------- | -------- | -------- | -------- |
| Yellowfin | 631,100 | 37,866 | -------- | -------- | -------- | -------- | -------- | -------- |
| Yellowtail | 14,100 | 548 | 79,300 | 3,081 | 3,900 | 152 | -------- | -------- |
| Total | 857,600 | 49,093 | 934,300 | 46,809 | 174,800 | 12,495 | 373,400 | 28,988 |
| SHELLFISH | | | | | | | | |
| Sea crawfish or spiny lobster | -------- | -------- | -------- | -------- | -------- | -------- | 200 | 20 |
| Grand total | 857,600 | 49,093 | 934,300 | 46,809 | 174,800 | 12,495 | 373,600 | 29,008 |

| Species | Lines | | | | Traps | | Harpoons | |
|---|---|---|---|---|---|---|---|---|
| | Set and hand | | Troll | | | | | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Barracuda | 469,400 | $24,136 | 51,100 | $2,627 | -------- | -------- | -------- | -------- |
| Cabrilla | 71,500 | 3,559 | -------- | -------- | -------- | -------- | -------- | -------- |
| Flounders, "California halibut" | 300 | 22 | -------- | -------- | -------- | -------- | -------- | -------- |
| Grayfish | 1,600 | 40 | -------- | -------- | -------- | -------- | -------- | -------- |
| Groupers | 53,000 | 2,567 | -------- | -------- | -------- | -------- | -------- | -------- |
| "Lingcod" | 100 | 3 | -------- | -------- | -------- | -------- | -------- | -------- |
| Mackerel | 64,700 | 797 | -------- | -------- | -------- | -------- | -------- | -------- |
| Perch | 100 | 4 | -------- | -------- | -------- | -------- | -------- | -------- |
| Rock bass | 73,700 | 3,186 | -------- | -------- | -------- | -------- | -------- | -------- |
| Rockfishes | 159,100 | 7,794 | -------- | -------- | -------- | -------- | -------- | -------- |
| Rudderfishes | 500 | 14 | -------- | -------- | -------- | -------- | -------- | -------- |
| Sculpin | 200 | 9 | -------- | -------- | -------- | -------- | -------- | -------- |
| Sea bass: | | | | | | | | |
| Black | 213,700 | 10,816 | -------- | -------- | -------- | -------- | -------- | -------- |
| White | 150,900 | 13,013 | 200 | 17 | -------- | -------- | -------- | -------- |
| Sheepshead | 6,300 | 226 | -------- | -------- | 300 | $11 | -------- | -------- |
| Smelt | 100 | 5 | -------- | -------- | -------- | -------- | -------- | -------- |
| Spanish mackerel | 7,700 | 274 | -------- | -------- | -------- | -------- | -------- | -------- |
| Swordfish | -------- | -------- | -------- | -------- | -------- | -------- | 35,400 | $4,481 |
| Tuna and tunalike fishes: | | | | | | | | |
| Bluefin | 84,400 | 4,812 | 600 | 34 | -------- | -------- | -------- | -------- |
| Bonito | 867,900 | 31,811 | 105,300 | 3,860 | -------- | -------- | -------- | -------- |
| Skipjack or striped tuna | 30,109,000 | 1,471,503 | -------- | -------- | -------- | -------- | -------- | -------- |
| Yellowfin | 64,742,100 | 3,862,435 | -------- | -------- | -------- | -------- | -------- | -------- |
| Whitefish | 20,900 | 1,060 | -------- | -------- | -------- | -------- | -------- | -------- |
| Yellowtail | 4,612,100 | 179,175 | 18,700 | 726 | -------- | -------- | -------- | -------- |
| Total | 101,709,300 | 5,617,261 | 175,900 | 7,264 | 300 | 11 | 35,400 | 4,481 |
| SHELLFISH | | | | | | | | |
| Sea crawfish or spiny lobster | -------- | -------- | -------- | -------- | 934,800 | 91,344 | -------- | -------- |
| Grand total | 101,709,300 | 5,617,261 | 175,900 | 7,264 | 935,100 | 91,355 | 35,400 | 4,481 |

## HALIBUT FISHERY OF THE PACIFIC COAST [10]

The halibut fishery of the Pacific coast, which is prosecuted by United States (including Alaska) and Canadian vessels, ranks as one of the foremost fisheries of that section. During 1937 the total catch of halibut by vessels of both nationalities amounted to 48,659,000 pounds, valued at $3,828,000. This is an increase of 1 percent in volume and 6 percent in value, as compared with the catch and its value in 1936. Of the total catch in 1937, 76 percent was taken by United States craft and 24 percent by Canadian craft. Considered according to ports of landing, 43 percent was landed at Seattle, Wash.; 39 percent at Canadian ports; and 18 percent at ports in Alsaka.

*Halibut fishery of the Pacific coast, 1937*

UNITED STATES OPERATING UNITS: BY FLEET CLASSIFICATION

| Item | Washington fleet | Alaska fleet | Total |
|---|---|---|---|
| Regular halibut vessels: | *Number* | *Number* | *Number* |
| Number | 131 | 113 | 244 |
| Net tonnage | 3,974 | 1,369 | 5,343 |
| Crew | 1,033 | 476 | 1 509 |
| Skates of lines | 4,052 | 2,113 | 6,165 |
| Vessels in other fisheries but landing one or more fares of halibut: | | | |
| Number | 13 | 42 | 55 |
| Net tonnage | 267 | 447 | 714 |
| Crew | 73 | 132 | 205 |
| Skates of lines | 289 | 534 | 823 |
| Regular halibut boats: | | | |
| Number | | 33 | 33 |
| Crew | | 81 | 81 |
| Skates of lines | | 381 | 381 |
| Boats in other fisheries but landing one or more fares of halibut: | | | |
| Number | | 67 | 67 |
| Crew | | 127 | 127 |
| Skates of lines | | 510 | 510 |

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[10] These statistics are compiled from data collected by the International Fisheries Commission for Washington and British Columbia and by Bureau agents for Alaska. The weights shown represent the poundage of fish landed after evisceration and removal of heads.

*Halibut fishery of the Pacific coast, 1937*—Continued

CATCH OF ALL SPECIES: BY UNITED STATES VESSELS AND BOATS

| Fleet classification | Landed in— | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Seattle, Wash. | | British Columbia | | Alaska | | | |
| WASHINGTON FLEET | | | | | | | | |
| Regular vessels: | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Halibut | 20,068,011 | $1,829,600 | 2,504,885 | $199,214 | 553,577 | $40,296 | 23,126,473 | $2,069,110 |
| Sablefish | 2,799,738 | 143,823 | 41,851 | 1,476 | 17,881 | 523 | 2,859,470 | 145,822 |
| "Lingcod" | 845,039 | 38,007 | -------- | -------- | 585 | 6 | 845,624 | 38,013 |
| Rockfishes | 307,425 | 15,926 | -------- | -------- | 2,735 | 27 | 310,160 | 15,953 |
| Total | 24,020,213 | 2,027,356 | 2,546,736 | 200,690 | 574,778 | 40,852 | 27,141,727 | 2,268,898 |
| Other vessels and boats: | | | | | | | | |
| Halibut | 447,232 | 37,087 | -------- | -------- | 36,240 | 2,404 | 483,472 | 39,491 |
| Sablefish | 3,303 | 248 | -------- | -------- | -------- | -------- | 3,303 | 248 |
| "Lingcod" | 55,852 | 1,952 | -------- | -------- | -------- | -------- | 55,852 | 1,952 |
| Rockfishes | 522 | 20 | -------- | -------- | -------- | -------- | 522 | 20 |
| Total | 506,909 | 39,307 | -------- | -------- | 36,240 | 2,404 | 543,149 | 41,711 |
| ALASKA FLEET | | | | | | | | |
| Regular vessels: | | | | | | | | |
| Halibut | 588,460 | 52,314 | 4,305,796 | 342,441 | 5,876,870 | 384,714 | 10,771,126 | 779,469 |
| Sablefish | 25,582 | 1,294 | 393,015 | 13,857 | 1,633,113 | 44,066 | 2,051,710 | 59,217 |
| "Lingcod" | 65,059 | 3,314 | -------- | -------- | 590 | 11 | 65,649 | 3,325 |
| Rockfishes | 34,654 | 1,694 | -------- | -------- | 10,054 | 139 | 44,708 | 1,833 |
| Total | 713,755 | 58,616 | 4,698,811 | 356,298 | 7,520,627 | 428,930 | 12,933,193 | 843,844 |
| Other vessels and boats: | | | | | | | | |
| Halibut | 64,405 | 5,102 | 210,633 | 16,751 | 2,235,517 | 130,307 | 2,510,555 | 152,160 |
| Sablefish | 323 | 16 | -------- | -------- | 69,349 | 1,785 | 69,672 | 1,801 |
| "Lingcod" | 845 | 34 | -------- | -------- | -------- | -------- | 845 | 34 |
| Rockfishes | -------- | -------- | -------- | -------- | 1,200 | 14 | 1,200 | 14 |
| Total | 65,573 | 5,152 | 210,633 | 16,751 | 2,306,066 | 132,106 | 2,582,272 | 154,009 |
| COMBINED FLEETS | | | | | | | | |
| Regular vessels: | | | | | | | | |
| Halibut | 20,656,471 | 1,881,914 | 6,810,681 | 541,655 | 6,430,447 | 425,010 | 33,897,599 | 2,848,579 |
| Sablefish | 2,825,320 | 145,117 | 434,866 | 15,333 | 1,650,994 | 44,589 | 4,911,180 | 205,039 |
| "Lingcod" | 910,098 | 41,321 | -------- | -------- | 1,175 | 17 | 911,273 | 41,338 |
| Rockfishes | 342,079 | 17,620 | -------- | -------- | 12,789 | 166 | 354,868 | 17,786 |
| Total | 24,733,968 | 2,085,972 | 7,245,547 | 556,988 | 8,095,405 | 469,782 | 40,074,920 | 3,112,742 |
| Other vessels and boats: | | | | | | | | |
| Halibut | 511,637 | 42,189 | 210,633 | 16,751 | 2,271,757 | 132,711 | 2,994,027 | 191,651 |
| Sablefish | 3,626 | 264 | -------- | -------- | 69,349 | 1,785 | 72,975 | 2,049 |
| "Lingcod" | 56,697 | 1,986 | -------- | -------- | -------- | -------- | 56,697 | 1,986 |
| Rockfishes | 522 | 20 | -------- | -------- | 1,200 | 14 | 1,722 | 34 |
| Total | 572,482 | 44,459 | 210,633 | 16,751 | 2,342,306 | 134,510 | 3,125,421 | 195,720 |
| All vessels and boats: | | | | | | | | |
| Halibut | 21,168,108 | 1,924,103 | 7,021,314 | 558,406 | 8,702,204 | 557,721 | 36,891,626 | 3,040,230 |
| Sablefish | 2,828,946 | 145,381 | 434,866 | 15,333 | 1,720,343 | 46,374 | 4,984,155 | 207,088 |
| "Lingcod" | 966,795 | 43,307 | -------- | -------- | 1,175 | 17 | 967,970 | 43,324 |
| Rockfishes | 342,601 | 17,640 | -------- | -------- | 13,989 | 180 | 356,590 | 17,820 |
| Grand total | 25,306,450 | 2,130,431 | 7,456,180 | 573,739 | 10,437,711 | 604,292 | 43,200,341 | 3,308,462 |

*Halibut fishery of the Pacific coast, 1937*—Continued

CATCH OF HALIBUT: BY UNITED STATES AND CANADIAN VESSELS AND BOATS

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Fleet classification | Landed in— | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Seattle, Wash. | | British Columbia | | Alaska | | | |
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| WASHINGTON FLEET | | | | | | | | |
| Regular halibut vessels | 20,068 | 1,830 | 2,505 | 199 | 554 | 40 | 23,127 | 2,069 |
| Other vessels and boats | 447 | 37 | | | 36 | 3 | 483 | 40 |
| Total | 20,515 | 1,867 | 2,505 | 199 | 590 | 43 | 23,610 | 2,109 |
| ALASKA FLEET | | | | | | | | |
| Regular halibut vessels | 588 | 52 | 4,306 | 342 | 5,877 | 385 | 10,771 | 779 |
| Other vessels and boats | 64 | 5 | 211 | 17 | 2,236 | 130 | 2,511 | 152 |
| Total | 652 | 57 | 4,517 | 359 | 8,113 | 515 | 13,282 | 931 |
| COMBINED FLEETS | | | | | | | | |
| Regular halibut vessels | 20,656 | 1,882 | 6,811 | 541 | 6,431 | 425 | 33,898 | 2,848 |
| Other vessels and boats | 511 | 42 | 211 | 17 | 2,272 | 133 | 2,994 | 192 |
| Total | 21,167 | 1,924 | 7,022 | 558 | 8,703 | 558 | 36,892 | 3,040 |
| British Columbia fleet | 18 | 2 | 11,746 | 786 | 3 | (1) | 11,767 | 788 |
| Grand total | 21,185 | 1,926 | 18,768 | 1,344 | 8,706 | 558 | 48,659 | 3,828 |

[1] Less than $500.

NOTE.—In addition to the above, it is estimated that about 1,190,477 pounds of halibut, sablefish, "ling-cod," and rockfish livers, valued at approximately $561,856, were landed by the combined fleets at Pacific coast ports during 1936.

The tabulation does not include landings at ports south of Seattle, Wash., which are normally less than 4 percent of the annual Pacific coast catch.

## VESSEL FISHERIES AT SEATTLE, WASH.

A total of 52,320,295 pounds of fishery products, valued at $3,664,057, were handled by Seattle wholesale dealers during 1937, exclusive of quantities received by transporting vessels or by rail from Alaska or Canada. This represents an increase of 5 percent in volume and 13 percent in value as compared with the quantity and value of the products handled during the preceding year. Of the total quantity handled, 25,306,450 pounds, valued at $2,130,431, were landed by fishing vessels—a decrease of 6 percent in volume and 3 percent in value as compared with the previous year. Receipts by wholesale dealers from sources other than Alaska or Canada, or from vessels in the halibut fleet, amounted to 27,013,845 pounds, valued at $1,533,626, which is an increase of 19 percent in volume and 46 percent in value.

*Fishery products landed by United States vessels at Seattle, Wash., 1937* [1]

BY FISHING GROUNDS

| Fishing grounds | Trips | Halibut |  |  |  | Sablefish |  | "Lingcod" |  | Rockfishes |  | Total |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | No. 1 |  | No. 2 |  |  |  |  |  |  |  |  |  |
|  | *Number* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| West of Cape Spencer | 455 | 10, 009, 925 | $979, 717 | 5, 512, 989 | $459, 605 | 72, 875 | $3, 140 | 6, 271 | $154 | 13, 723 | $593 | 15, 615, 783 | $1, 443, 209 |
| South of Cape Spencer | 742 | 2, 614, 245 | 253, 971 | 3, 030, 949 | 230, 810 | 2, 756, 071 | 142, 241 | 960, 524 | 43, 153 | 328, 878 | 17, 047 | 9, 690, 667 | 687, 222 |
| Total | 1, 197 | 12, 624, 170 | 1, 233, 688 | 8, 543, 938 | 690, 415 | 2, 828, 946 | 145, 381 | 966, 795 | 43, 307 | 342, 601 | 17, 640 | 25, 306, 450 | 2, 130, 431 |

[1] Halibut fleet.

BY MONTHS

| Months | Trips | Halibut |  |  |  | Sablefish |  | "Lingcod" |  | Rockfishes |  | Total |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | No. 1 |  | No. 2 |  |  |  |  |  |  |  |  |  |
|  | *Number* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| January | 16 |  |  |  |  | 7, 512 | $592 | 103, 992 | $6, 994 | 67, 702 | $4, 144 | 179, 206 | $11, 730 |
| February | 27 |  |  |  |  | 818 | 38 | 148, 224 | 8, 241 | 66, 835 | 3, 898 | 215, 877 | 12, 177 |
| March | 84 | 895, 594 | $77, 753 | 455, 199 | $31, 017 | 19, 858 | 892 | 48, 170 | 1, 900 | 12, 320 | 561 | 1, 431, 141 | 112, 123 |
| April | 162 | 2, 013, 616 | 175, 503 | 1, 013, 116 | 67, 161 | 19, 813 | 1, 002 | 106, 603 | 4, 851 | 9, 459 | 517 | 3, 162, 607 | 249, 034 |
| May | 167 | 1, 921, 990 | 171, 325 | 1, 428, 607 | 98, 559 | 6, 627 | 261 | 136, 264 | 3, 808 | 16, 536 | 665 | 3, 510, 024 | 274, 618 |
| June | 149 | 1, 808, 180 | 165, 920 | 1, 476, 406 | 117, 518 | 73, 776 | 5, 163 | 77, 278 | 2, 840 | 9, 454 | 484 | 3, 445, 094 | 291, 925 |
| July | 150 | 1, 736, 080 | 168, 127 | 1, 559, 500 | 128, 695 | 132, 214 | 7, 609 | 67, 295 | 2, 772 | 20, 697 | 908 | 3, 515, 786 | 308, 111 |
| August | 89 | 1, 256, 171 | 139, 816 | 873, 772 | 85, 379 | 373, 563 | 17, 414 | 38, 287 | 1, 496 | 27, 192 | 1, 052 | 2, 568. 985 | 245, 157 |
| September | 117 | 1, 343, 719 | 154, 107 | 818, 465 | 75, 813 | 767, 487 | 37, 663 | 54, 927 | 1, 786 | 21, 053 | 666 | 3, 005, 651 | 270, 035 |
| October | 143 | 1, 648, 820 | 181, 137 | 918, 873 | 86, 273 | 936, 933 | 49, 314 | 48, 703 | 1, 751 | 9, 934 | 298 | 3, 563, 263 | 318, 773 |
| November | 66 |  |  |  |  | 425, 119 | 21, 974 | 46, 633 | 2, 467 | 34, 277 | 1, 770 | 506, 029 | 26, 211 |
| December | 27 |  |  |  |  | 65, 226 | 3, 459 | 90, 419 | 4, 401 | 47, 142 | 2, 677 | 202, 787 | 10, 537 |
| Total | 1, 197 | 12, 624, 170 | 1, 233, 688 | 8, 543, 938 | 690, 415 | 2, 828, 946 | 145, 381 | 966, 795 | 43, 307 | 342, 601 | 17, 640 | 25, 306, 450 | 2, 130, 431 |

NOTE.—The statistics in this table are compiled from reports collected by the Bureau of Fisheries and the International Fisheries Commission.

*Fishery products received by Seattle wholesale dealers, 1937; by months* [1]

| Species | January | | February | | March | | April | | May | | June | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod | 58, 882 | $1, 384 | 101, 834 | $3, 045 | 147, 557 | $3, 276 | 51, 614 | $929 | 18, 992 | $393 | 1, 891 | $55 |
| Flounders: | | | | | | | | | | | | |
| "Sole" | 183, 954 | 5, 390 | 163, 901 | 4, 737 | 212, 297 | 7, 664 | 256, 407 | 7, 051 | 340, 713 | 8, 279 | 478, 888 | 10, 152 |
| Other | 75, 868 | 1, 441 | 108, 764 | 2, 827 | 53, 817 | 1, 189 | 11, 195 | 224 | 4, 551 | 69 | 2, 535 | 45 |
| Halibut | | | | | 1, 312 | 201 | 2, 688 | 174 | 33, 623 | 1, 917 | 63, 673 | 4, 081 |
| Herring | 6, 190 | 125 | 64, 786 | 1, 166 | 391, 650 | 2, 962 | | | | | | |
| "Lingcod" | 20, 735 | 460 | 36, 032 | 1, 117 | 63, 355 | 1, 730 | 55, 093 | 1, 107 | 169, 587 | 2, 713 | 80, 174 | 1, 267 |
| Perch | 5, 767 | 204 | 11, 327 | 467 | 14, 705 | 603 | 22, 379 | 768 | 9, 183 | 359 | 1, 416 | 48 |
| Rockfishes | 8, 665 | 250 | 13, 549 | 448 | 23, 784 | 523 | 18, 248 | 449 | 9, 599 | 319 | 6, 883 | 256 |
| Sablefish | | | | | | | | | | | 2, 501 | 75 |
| Salmon: | | | | | | | | | | | | |
| Blueback, red or sockeye | | | | | | | | | | | 54 | 4 |
| Chinook or king | | | 302 | 40 | 112, 339 | 16, 579 | 318, 676 | 36, 903 | 221, 017 | 23, 671 | 798, 635 | 75, 951 |
| Silver or coho | | | | | | | 69 | 4 | 4, 072 | 322 | 173, 374 | 12, 309 |
| Smelt | 22, 247 | 1, 506 | 24, 837 | 1, 411 | 27, 884 | 1, 104 | 968 | 74 | 10, 321 | 960 | 13, 919 | 1, 282 |
| Crabs | 191, 091 | 14, 465 | 89, 638 | 7, 001 | 171, 404 | 12, 855 | 123, 832 | 11, 888 | 143, 964 | 13, 245 | 163, 704 | 16, 174 |
| Shrimp | | | | | | | 20, 335 | 2, 419 | 5, 345 | 738 | 353 | 49 |
| Clams, hard, in shell (meats) | 21, 672 | 1, 732 | 33, 910 | 2, 712 | 57, 492 | 4, 565 | 53, 773 | 4, 248 | 250 | 18 | | |
| Scallops, bay (meats) | 1, 530 | 363 | 1, 918 | 441 | 2, 086 | 490 | 1, 656 | 389 | 1, 791 | 435 | 1, 558 | 366 |
| Octopus | 3, 051 | 95 | 4, 735 | 136 | 7, 513 | 225 | 4, 503 | 135 | 4, 412 | 181 | 3, 414 | 137 |
| Squid | 1, 655 | 116 | | | | | | | | | 900 | 36 |
| Total | 601, 307 | 27, 531 | 655, 533 | 25, 548 | 1, 287, 195 | 53, 966 | 941, 436 | 66, 762 | 977, 420 | 53, 619 | 1, 793, 872 | 122, 287 |

See footnotes at end of table.

*Fishery products received by Seattle wholesale dealers, 1937; by months*—Continued

| Species | July | | August | | September | | October | | November | | December | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod | 5,942 | $154 | 8,337 | $106 | 17,121 | $274 | 15,503 | $319 | 52,212 | $1,138 | 65,011 | $1,749 | 544,896 | $12,822 |
| Flounders: | | | | | | | | | | | | | | |
| "Sole" | 404,985 | 8,411 | 339,528 | 7,334 | 428,989 | 10,596 | 272,183 | 6,968 | 76,181 | 2,369 | 189,756 | 6,983 | 3,347,782 | 85,934 |
| Other | 238 | 3 | 552 | 8 | 101 | 2 | 990 | 15 | 10,599 | 247 | 169,801 | 4,279 | 439,011 | 10,349 |
| Halibut | 50,059 | 3,409 | 10,193 | 675 | 819 | 67 | 259 | 26 | | | | | 162,626 | 10,550 |
| Herring | | | | | | | 360 | 7 | | | 1,045 | 21 | 464,031 | 4,281 |
| "Lingcod" | 103,965 | 2,443 | 194,355 | 4,315 | 192,566 | 4,737 | 72,948 | 1,590 | 41,467 | 1,004 | 38,800 | 1,299 | 1,069,077 | 23,782 |
| Perch | 772 | 31 | 2,384 | 81 | 4,916 | 167 | 8,703 | 303 | 6,306 | 223 | 11,703 | 380 | 99,561 | 3,634 |
| Rockfishes | 12,357 | 219 | 12,218 | 333 | 21,268 | 564 | 16,707 | 373 | 4,711 | 123 | 14,221 | 465 | 162,210 | 4,322 |
| Sablefish | 76,643 | 2,399 | 83,882 | 2,340 | 6,109 | 153 | 7,574 | 183 | 13,304 | 466 | | | 190,013 | 5,616 |
| Salmon: | | | | | | | | | | | | | | |
| Blueback, red or sockeye | 13,508 | 1,234 | 62,039 | 6,167 | 20,036 | 1,843 | 70 | 6 | | | | | 95,707 | 9,254 |
| Chinook or king | 1,341,683 | 114,607 | 1,600,269 | 161,147 | 1,040,379 | 100,709 | 449,798 | 40,752 | 137,111 | 8,943 | 291 | 32 | 6,020,500 | 579,334 |
| Chum or keta | | | 497 | 16 | 13,775 | 441 | 2,478,965 | 82,302 | 3,516,837 | 113,242 | 817 | 29 | 6,010,891 | 196,030 |
| Humpback or pink | 183,557 | 4,304 | 417,302 | 13,354 | 678,647 | 22,395 | 2,280 | 60 | | | | | 1,281,786 | 40,113 |
| Silver or coho | 481,003 | 33,090 | 803,009 | 60,306 | 1,043,509 | 81,185 | 1,910,573 | 139,853 | 201,374 | 15,486 | 2,075 | 166 | 4,619,058 | 342,721 |
| Smelt | 17,664 | 1,351 | 73,787 | 4,132 | 65,895 | 3,347 | 58,811 | 3,270 | 35,872 | 2,581 | 27,775 | 1,964 | 379,980 | 22,982 |
| Crabs | 102,628 | 10,468 | 94,490 | 9,657 | 73,150 | 7,461 | 190,334 | 14,389 | 151,648 | 10,934 | 193,004 | 12,796 | [2] 1,688,887 | 141,333 |
| Shrimp | 213 | 28 | 1,361 | 245 | 1,894 | 321 | 2,549 | 474 | 1,678 | 310 | 4,343 | 777 | 38,071 | 5,361 |
| Clams, hard, in shell (meats) | | | | | 43,504 | 3,881 | 42,840 | 3,836 | 39,469 | 3,536 | 40,019 | 3,569 | 332,929 | 28,097 |
| Scallops, bay (meats) | 2,064 | 486 | 2,008 | 487 | 1,736 | 422 | 2,487 | 587 | 1,579 | 369 | 1,818 | 466 | 22,231 | 5,301 |
| Octopus | 566 | 23 | 340 | 19 | 1,758 | 102 | 3,733 | 164 | 3,627 | 211 | 3,985 | 203 | 41,637 | 1,631 |
| Squid | | | | | | | | | | | 406 | 27 | 2,961 | 179 |
| Total | 2,797,847 | 182,660 | 3,706,551 | 270,722 | 3,656,172 | 238,667 | 5,537,667 | 295,477 | 4,293,975 | 161,182 | 764,870 | 35,205 | 27,013,845 | 1,533,626 |

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[1] This tabulation does not include fish received from Alaska or Canada or vessels in the halibut fleet.

[2] 78,550 dozen.

NOTE.—The yields of bivalve mollusks have been converted from weights in the shell to weights of meats on the following basis: Hard clams, 25 per cent, and bay scallops 17 percent.

## LAKE FISHERIES [11]

In 1937 the yield of the fisheries of the Great Lakes, including those of the international lakes of northern Minnesota, in the United States and Canada amounted to 116,063,700 pounds, representing a decrease of 7 percent as compared with the catch in the preceding year.

Considering the fishery of United States craft only, the catch amounted to 83,958,400 pounds, valued at $6,033,084, which is a decrease of 11 percent in volume and 6 percent in value as compared with the catch in the previous year. These fisheries gave employment to 6,418 fishermen as compared with 5,623 in the previous year.

*Lake fisheries of the United States and Canada, 1937*

CATCH: BY LAKES

| Species | Lake Ontario | | | Lake Erie | | |
|---|---|---|---|---|---|---|
| | United States | Canada | Total | United States | Canada | Total |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Blue pike | 60, 100 | 26, 200 | 86, 300 | 10, 960, 800 | 9, 354, 700 | 20, 315, 500 |
| Bowfin | 300 | (1) | 300 | | | |
| Burbot | 35, 700 | (1) | 35, 700 | 369, 700 | (1) | 369, 700 |
| Carp | 86, 200 | 153, 000 | 239, 200 | 2, 153, 100 | 337, 900 | 2, 491, 000 |
| Catfish and bullheads | 68, 700 | 210, 800 | 279, 500 | 804, 400 | 56, 700 | 861, 100 |
| Cisco | | | | 64, 000 | 99, 400 | 163, 400 |
| Eels | 10, 100 | 66, 000 | 76, 100 | | | |
| Garfish | | | | 6, 400 | (1) | 6, 400 |
| Goldfish | | | | 267, 400 | (1) | 267, 400 |
| Lake herring | 123, 800 | 1, 572, 900 | 1, 696, 700 | | | |
| Lake trout | 12, 900 | 205, 000 | 217, 900 | 2, 600 | 200 | 2, 800 |
| Mooneye | | | | 14, 900 | (1) | 14, 900 |
| Pike or pickerel (jacks) | 9, 400 | 141, 400 | 150, 800 | 3, 500 | 2, 800 | 6, 300 |
| Rock bass | 7, 400 | (1) | 7, 400 | 3, 300 | (1) | 3, 300 |
| Sauger | | | | 1, 214, 300 | (1) | 1, 214, 300 |
| Sheepshead | | | | 4, 059, 200 | (1) | 4, 059, 200 |
| Sturgeon | 12, 300 | 8, 000 | 20, 300 | 5, 800 | 13, 300 | 19, 100 |
| Sucker "mullet" | 49, 400 | (1) | 49, 400 | 1, 103, 300 | (1) | 1, 103, 300 |
| Sunfish | 32, 500 | (1) | 32, 500 | | | |
| White bass | | | | 435, 100 | (1) | 435, 100 |
| Whitefish, common | 56, 700 | 551, 600 | 608, 300 | 647, 500 | 1, 401, 000 | 2, 048, 500 |
| Yellow perch | 49, 000 | 148, 000 | 197, 000 | 1, 750, 200 | 1, 691, 100 | 3, 441, 300 |
| Yellow pike | 3, 900 | 21, 800 | 25, 700 | 3, 060, 000 | 449, 000 | 3, 509, 000 |
| Mussel shells | | | | 7, 100 | (1) | 7, 100 |
| Miscellaneous | | 271, 900 | 271, 900 | | 1, 258, 100 | 1, 258, 100 |
| Total | 618, 400 | 3, 376, 600 | 3, 995, 000 | 26, 932, 600 | 14, 664, 200 | 41, 596, 800 |

[1] Where there has been a Canadian catch of these species it is included under "Miscellaneous."

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[11] The statistics of the catch presented herewith were obtained principally from records of the various State fishery agencies. The data for the operating units (fishermen, vessels, boats, and gear) of the United States were obtained largely by Bureau agents in a special canvass; although State records in several instances were very helpful in this work. In all cases the statistics collected are for the calendar year, except for Lake of the Woods, Rainy Lake, and Lake Namakan in Minnesota, which are for two seasons. For Lake of the Woods, the seasons are from June 1 to November 1 and December 1 to April 1 and for Rainy and Namakan Lakes from May 15 to November 1 and December 1 to April 1. The catches for these two seasons, in the order named, have been combined to constitute a year. The quantity of fish taken in these lakes between January 1 and April 1 is estimated at less than 3 percent of the total catch.

## *Lake fisheries of the United States and Canada, 1937*—Continued

CATCH: BY LAKES—Continued

| Species | Lake Huron | | | Lake Michigan | Lake Superior | | |
|---|---|---|---|---|---|---|---|
| | United States | Canada | Total | United States | United States | Canada | Total |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Blue pike | | 21,000 | 21,000 | | | 5,900 | 5,900 |
| Bowfin | 700 | (1) | 700 | | | | |
| Burbot | 800 | (1) | 800 | 39,500 | 1,400 | (1) | 1,400 |
| Carp | 978,100 | 40,000 | 1,018,100 | 1,924,800 | 200 | 600 | 800 |
| Catfish and bullheads | 143,500 | 6,900 | 150,400 | 58,600 | 100 | (1) | 100 |
| Chubs | 190,300 | 605,100 | 795,400 | 5,579,200 | 275,000 | 131,100 | 406,100 |
| Lake herring | 4,150,000 | 229,500 | 4,379,500 | 5,499,500 | 11,784,100 | 2,247,000 | 14,031,100 |
| Lake trout | 1,340,200 | 3,901,900 | 5,242,100 | 4,987,300 | 3,084,900 | 1,698,600 | 4,783,500 |
| Pike or pickerel (jacks) | 13,100 | 107,400 | 120,500 | 14,000 | 24,100 | 7,400 | 31,500 |
| Rock bass | 24,900 | (1) | 24,900 | 1,500 | | | |
| Sauger | 5,800 | (1) | 5,800 | 300 | 100 | (1) | 100 |
| Sheepshead | 4,200 | (1) | 4,200 | 5,600 | | | |
| Smelt | | | | 1,425,500 | | | |
| Sturgeon | | 17,300 | 17,300 | | | 1,600 | 1,600 |
| Sucker "mullet" | 1,725,900 | (1) | 1,725,900 | 2,381,400 | 447,100 | (1) | 447,100 |
| White bass | | | | 300 | | | |
| Whitefish: | | | | | | | |
| Common | 1,018,700 | 1,664,100 | 2,682,800 | 1,072,600 | 363,600 | 300,800 | 664,400 |
| Menominee | 72,100 | (1) | 72,100 | 47,300 | 18,200 | (1) | 18,200 |
| Yellow perch | 547,600 | 156,400 | 704,000 | 2,489,300 | 9,000 | (1) | 9,000 |
| Yellow pike | 1,626,700 | 398,800 | 2,025,500 | 78,000 | 3,500 | 61,800 | 65,300 |
| Crawfish | | | | 6,400 | | | |
| Mussel shells | 52,400 | (1) | 52,400 | 787,000 | | | |
| Miscellaneous | | 426,700 | 426,700 | | | 54,300 | 54,300 |
| Total | 11,895,000 | 7,575,100 | 19,470,100 | 26,398,100 | 16,011,300 | 4,509,100 | 20,520,400 |

| Species | Namakan Lake | | | Rainy Lake | | |
|---|---|---|---|---|---|---|
| | United States | Canada | Total | United States | Canada | Total |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Burbot | 300 | (1) | 300 | 300 | (1) | 300 |
| Chubs | | | | | 6,100 | 6,100 |
| Pike or pickerel (jacks) | 2,000 | 1,500 | 3,500 | 28,700 | 96,200 | 124,900 |
| Sturgeon | | 800 | 800 | | 100 | 100 |
| Sucker "mullet" | 100 | (1) | 100 | 1,500 | (1) | 1,500 |
| Whitefish, common | 26,400 | 10,200 | 36,600 | 38,900 | 90,500 | 129,400 |
| Yellow perch | | | | 2,800 | 6,800 | 9,600 |
| Yellow pike | 6,700 | 2,000 | 8,700 | 42,400 | 105,400 | 147,800 |
| Miscellaneous | | 100 | 100 | | 98,000 | 98,000 |
| Total | 35,500 | 14,600 | 50,100 | 114,600 | 403,100 | 517,700 |

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[1] Where there has been a Canadian catch of these species it is included under "Miscellaneous."

## *Lake fisheries of the United States and Canada, 1937*—Continued

### CATCH: By lakes—Continued

| Species | Lake of the Woods |  |  | Total, all lakes |  |  |
|---|---|---|---|---|---|---|
|  | United States | Canada | Total | United States | Canada | Total |
|  | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Blue pike |  | 1,800 | 1,800 | 11,020,900 | 9,409,600 | 20,430,500 |
| Bowfin |  |  |  | 1,000 | (1) | 1,000 |
| Burbot | 46,800 | (1) | 46,800 | 494,500 | (1) | 494,500 |
| Carp | 17,500 | 2,300 | 19,800 | 5,159,900 | 533,800 | 5,693,700 |
| Catfish and bullheads | 44,200 | 33,700 | 77,900 | 1,119,500 | 308,100 | 1,427,600 |
| Chubs |  |  |  | 6,044,500 | 742,300 | 6,786,800 |
| Cisco |  |  |  | 64,000 | 99,400 | 163,400 |
| Crappie | 200 | (1) | 200 | 200 | (1) | 200 |
| Eels |  |  |  | 10,100 | 66,000 | 76,100 |
| Garfish |  |  |  | 6,400 | (1) | 6,400 |
| Goldfish |  |  |  | 267,400 | (1) | 267,400 |
| Lake herring |  |  |  | 21,557,400 | 4,049,400 | 25,606,800 |
| Lake trout |  | 8,100 | 8,100 | 9,427,900 | 5,813,800 | 15,241,700 |
| Mooneye |  |  |  | 14,900 | (1) | 14,900 |
| Pike or pickerel (jacks) | 163,400 | 430,900 | 594,300 | 258,200 | 787,600 | 1,045,800 |
| Rock bass |  |  |  | 37,100 | (1) | 37,100 |
| Sauger | 415,000 | 16,800 | 431,800 | 1,635,500 | 16,800 | 1,652,300 |
| Sheepshead |  |  |  | 4,069,000 | (1) | 4,069,000 |
| Smelt |  |  |  | 1,425,500 | (1) | 1,425,500 |
| Sturgeon |  | 200 | 200 | 18,100 | 41,300 | 59,400 |
| Sucker "mullet" | 183,600 | 900 | 184,500 | 5,892,300 | 900 | 5,893,200 |
| Sunfish |  |  |  | 32,500 | (1) | 32,500 |
| Tullibees | 223,300 | 96,200 | 319,500 | 223,300 | 96,200 | 319,500 |
| White bass |  |  |  | 435,400 | (1) | 435,400 |
| Whitefish: |  |  |  |  |  |  |
| Common | 3,800 | 154,600 | 158,400 | 3,228,200 | 4,172,800 | 7,401,000 |
| Menominee |  |  |  | 137,600 | (1) | 137,600 |
| Yellow perch | 218,700 | 28,000 | 246,700 | 5,066,600 | 2,030,300 | 7,096,900 |
| Yellow pike | 636,400 | 633,500 | 1,269,900 | 5,457,600 | 1,672,300 | 7,129,900 |
| Crawfish |  |  |  | 6,400 | (1) | 6,400 |
| Mussel shells |  |  |  | 846,500 | (1) | 846,500 |
| Miscellaneous |  | 155,600 | 155,600 |  | 2,264,700 | 2,264,700 |
| Total | 1,952,900 | 1,562,600 | 3,515,500 | 83,958,400 | 32,105,300 | 116,063,700 |

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[1] Where there has been a Canadian catch of these species it is included under "Miscellaneous."

## *Lake fisheries of the United States, 1937*

### OPERATING UNITS: By lakes

| Item | Lake Ontario | Lake Erie | Lake Huron | Lake Michigan | Lake Superior | Lake of the Woods, Rainy Lake, and Namakan Lake | Total |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 16 | 270 | 137 | 1,042 | 197 |  | 1,662 |
| On boats and shore: |  |  |  |  |  |  |  |
| Regular | 35 | 732 | 665 | 790 | 770 | 131 | 3,123 |
| Casual | 107 | 311 | 129 | 826 | 260 |  | 1,633 |
| Total | 158 | 1,313 | 931 | 2,658 | 1,227 | 131 | 6,418 |
| Vessels: |  |  |  |  |  |  |  |
| Steam: |  |  |  |  |  |  |  |
| 5 to 10 tons |  |  | 1 | 3 |  |  | 4 |
| 11 to 20 tons |  | 3 | 3 | 11 |  |  | 17 |
| 21 to 30 tons |  | 7 | 1 | 5 | 3 |  | 16 |
| 31 to 40 tons |  | 4 |  | 3 | 1 |  | 8 |
| 41 to 50 tons |  | 2 |  | 1 |  |  | 3 |
| 51 to 60 tons |  |  |  | 1 |  |  | 1 |
| Total |  | 16 | 5 | 24 | 4 |  | 49 |
| Net tonnage |  | 433 | 81 | 523 | 109 |  | 1,146 |

## *Lake fisheries of the United States, 1937*—Continued

### OPERATING UNITS: BY LAKES—Continued

| Item | Lake Ontario | Lake Erie | Lake Huron | Lake Michigan | Lake Superior | Lake of the Woods, Rainy Lake, and Namakan Lake | Total |
|---|---|---|---|---|---|---|---|
| Vessels—Continued. | | | | | | | |
| Motor: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| 5 to 10 tons | 3 | 19 | 15 | 158 | 45 | | 240 |
| 11 to 20 tons | 1 | 13 | 8 | 112 | 10 | | 144 |
| 21 to 30 tons | | 1 | 4 | 27 | 4 | | 36 |
| 31 to 40 tons | | 2 | 3 | 3 | 2 | | 10 |
| 41 to 50 tons | | | | 1 | | | 1 |
| 51 to 60 tons | | | 1 | 1 | | | 2 |
| Total | 4 | 35 | 31 | 302 | 61 | | 433 |
| Net tonnage | 42 | 409 | 467 | 3, 656 | 626 | | 5, 200 |
| Total vessels | 4 | 51 | 36 | 326 | 65 | | 482 |
| Total net tonnage | 42 | 842 | 548 | 4, 179 | 735 | | 6, 346 |
| Boats: | | | | | | | |
| Motor | 46 | 288 | 246 | 493 | 468 | 96 | 1, 637 |
| Other | 48 | 315 | 127 | 550 | 339 | 29 | 1, 408 |
| Accessory boats | | | | 3 | 6 | | 9 |
| Apparatus: | | | | | | | |
| Haul seines | 6 | 128 | 55 | 58 | 12 | | 259 |
| Length, yards | 483 | 63, 928 | 27, 173 | 21, 034 | 1, 553 | | 114, 171 |
| Gill nets: | | | | | | | |
| "Shoal," 2⅛ to 3⅞ inches | 1, 720 | 15, 771 | 2, 775 | 60, 059 | 10, 381 | | 90, 706 |
| Square yards | 231, 064 | 1, 991, 744 | 544, 900 | 13. 288, 670 | 2, 361, 396 | | 18, 417, 774 |
| "Shoal," 4 to 7 inches | 468 | 10, 026 | 5, 618 | 45, 537 | 10, 164 | 264 | 72, 077 |
| Square yards | 83, 200 | 2, 069, 838 | 1, 477, 400 | 10, 560, 032 | 3, 330, 868 | 79, 712 | 17. 601, 050 |
| "Shoal," 10 to 14 inches | 26 | 20 | | | | | 46 |
| Square yards | 15, 730 | 9, 328 | | | | | 25, 058 |
| Bar nets | | 113 | | | | | 113 |
| Square yards | | 4, 649 | | | | | 4, 649 |
| Trammel nets | | | | 2 | | | 2 |
| Square yards | | | | 350 | | | 350 |
| Lines: | | | | | | | |
| Troll | | | | | 60 | | 60 |
| Hooks | | | | | 400 | | 400 |
| Trot | 37 | 39 | 577 | 1, 232 | 3, 250 | | 5, 135 |
| Hooks | 13, 225 | 14, 760 | 171, 000 | 357, 475 | 666, 110 | | 1, 222, 570 |
| Pound nets | | 41 | 418 | 621 | 183 | 69 | 1, 332 |
| Trap nets | 150 | 5, 346 | 2, 903 | 447 | 74 | | 8, 920 |
| Fyke nets | 140 | 667 | 192 | 1, 682 | 21 | 98 | 2, 800 |
| Crawfish pots | | | | 850 | | | 850 |
| Crowfoot bars | | 4 | 3 | 151 | | | 158 |
| Picks | | | 7 | 30 | | | 37 |

### OPERATING UNITS: BY STATES AND LAKES

| Item | New York | | | Pennsylvania—Lake Erie | Ohio—Lake Erie |
|---|---|---|---|---|---|
| | Lake Ontario | Lake Erie | Total | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 16 | 44 | 60 | 123 | 103 |
| On boats and shore: | | | | | |
| Regular | 35 | 16 | 51 | 31 | 614 |
| Casual | 107 | 62 | 169 | 9 | 187 |
| Total | 158 | 122 | 280 | 163 | 904 |
| Vessels: | | | | | |
| Steam: | | | | | |
| 11 to 20 tons | | | | 3 | |
| 21 to 30 tons | | 1 | 1 | 6 | |
| 31 to 40 tons | | 1 | 1 | | 3 |
| 41 to 50 tons | | | | | 2 |
| Total | | 2 | 2 | 9 | 5 |
| Net tonnage | | 56 | 56 | 185 | 192 |

*Lake fisheries of the United States, 1937*—Continued

OPERATING UNITS: By States and lakes—Continued

| Item | New York | | | Pennsylvania—Lake Erie | Ohio—Lake Erie |
|---|---|---|---|---|---|
| | Lake Ontario | Lake Erie | Total | | |
| Vessels—Continued. | | | | | |
| Motor: | *Number* | *Number* | *Number* | *Number* | *Number* |
| 5 to 10 tons | 3 | 6 | 9 | 7 | 6 |
| 11 to 20 tons | 1 | 1 | 2 | 4 | 8 |
| 21 to 30 tons | | | | 1 | |
| 31 to 40 tons | | | | 1 | 1 |
| Total | 4 | 7 | 11 | 13 | 15 |
| Net tonnage | 42 | 53 | 95 | 161 | 195 |
| Total vessels | 4 | 9 | 13 | 22 | 20 |
| Total net tonnage | 42 | 109 | 151 | 346 | 387 |
| Boats: | | | | | |
| Motor | 46 | 15 | 61 | 8 | 245 |
| Other | 48 | 28 | 76 | 1 | 244 |
| Apparatus: | | | | | |
| Haul seines | 6 | 6 | 12 | | 91 |
| Length, yards | 483 | 516 | 999 | | 54,561 |
| Gill nets: | | | | | |
| "Shoal," 2⅛ to 3⅞ inches | 1,720 | 1,669 | 3,389 | 7,167 | 6,732 |
| Square yards | 231,064 | 278,210 | 509,274 | 921,228 | 771,806 |
| "Shoal," 4 to 7 inches | 468 | 2,532 | 3,000 | 5,637 | 1,716 |
| Square yards | 83,200 | 550,882 | 634,082 | 1,215,718 | 288,738 |
| "Shoal," 10 to 14 inches | 26 | 8 | 34 | | 12 |
| Square yards | 15,730 | 2,128 | 17,858 | | 7,200 |
| Bar nets | | | | | 113 |
| Square yards | | | | | 4,649 |
| Lines, Trot | 37 | 20 | 57 | | |
| Hooks | 13,225 | 10,000 | 23,225 | | |
| Pound nets | | | | 41 | |
| Trap nets | 150 | 16 | 166 | | 5,145 |
| Fyke nets | 140 | | 140 | | 388 |

| Item | Michigan | | | | | Indiana—Lake Michigan |
|---|---|---|---|---|---|---|
| | Lake Erie | Lake Huron | Lake Michigan | Lake Superior | Total | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | 137 | 378 | 109 | 624 | 24 |
| On boats and shore: | | | | | | |
| Regular | 71 | 665 | 371 | 315 | 1,422 | 10 |
| Casual | 53 | 129 | 327 | 142 | 651 | 1 |
| Total | 124 | 931 | 1,076 | 566 | 2,697 | 35 |
| Vessels: | | | | | | |
| Steam: | | | | | | |
| 5 to 10 tons | | 1 | 2 | | 3 | |
| 11 to 20 tons | | 3 | 6 | | 9 | |
| 21 to 30 tons | | 1 | 1 | 3 | 5 | 1 |
| 31 to 40 tons | | | | 1 | 1 | |
| Total | | 5 | 9 | 4 | 18 | 1 |
| Net tonnage | | 81 | 124 | 109 | 314 | 22 |
| Motor: | | | | | | |
| 5 to 10 tons | | 15 | 53 | 13 | 81 | 2 |
| 11 to 20 tons | | 8 | 34 | 7 | 49 | 3 |
| 21 to 30 tons | | 4 | 9 | 3 | 16 | 1 |
| 31 to 40 tons | | 3 | | 2 | 5 | |
| 51 to 60 tons | | 1 | | | 1 | |
| Total | | 31 | 96 | 25 | 152 | 6 |
| Net tonnage | | 467 | 1,104 | 343 | 1,914 | 86 |
| Total vessels | | 36 | 105 | 29 | 170 | 7 |
| Total net tonnage | | 548 | 1,228 | 452 | 2,228 | 108 |

*Lake fisheries of the United States, 1937*—Continued

OPERATING UNITS: BY STATES AND LAKES—Continued

| Item | Michigan | | | | | Indiana—Lake Michigan |
|---|---|---|---|---|---|---|
| | Lake Erie | Lake Huron | Lake Michigan | Lake Superior | Total | |
| Boats: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Motor | 20 | 246 | 221 | 212 | 699 | 4 |
| Other | 42 | 127 | 167 | 66 | 402 | 3 |
| Apparatus: | | | | | | |
| Haul seines | 31 | 55 | 1 | 12 | 99 | ---------- |
| Length, yards | 8,851 | 27,173 | 65 | 1,553 | 37,642 | ---------- |
| Gill nets: | | | | | | |
| "Shoal," 2⅛ to 3⅞ inches | 203 | 2,775 | 14,895 | 4,316 | 22,189 | 992 |
| Square yards | 20,500 | 544,900 | 2,750,870 | 757,695 | 4,073,965 | 198,400 |
| "Shoal," 4 to 7 inches | 141 | 5,618 | 20,513 | 5,711 | 31,983 | 676 |
| Square yards | 14,500 | 1,477,400 | 4,577,872 | 1,887,588 | 7,957,360 | 135,200 |
| Lines: | | | | | | |
| Troll | ---------- | ---------- | ---------- | 60 | 60 | ---------- |
| Hooks | ---------- | ---------- | ---------- | 400 | 400 | ---------- |
| Trot | 19 | 577 | 485 | 2,356 | 3,437 | ---------- |
| Hooks | 4,760 | 171,000 | 149,800 | 586,700 | 912,260 | ---------- |
| Pound nets | ---------- | 418 | 283 | 90 | 791 | 4 |
| Trap nets | 185 | 2,903 | 447 | 74 | 3,609 | ---------- |
| Fyke nets | 279 | 192 | 96 | 6 | 573 | ---------- |
| Crowfoot bars | 4 | 3 | 111 | ---------- | 118 | ---------- |
| Picks | ---------- | 7 | 30 | ---------- | 37 | ---------- |

| Item | Illinois—Lake Michigan | Wisconsin | | | Minnesota | | |
|---|---|---|---|---|---|---|---|
| | | Lake Michigan | Lake Superior | Total | Lake Superior | Lake of the Woods, Rainy Lake, and Namakan Lake | Total |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 77 | 563 | 88 | 651 | ---------- | ---------- | ---------- |
| On boats and shore: | | | | | | | |
| Regular | 2 | 407 | 125 | 532 | 330 | 131 | 461 |
| Casual | 2 | 496 | 47 | 543 | 71 | ---------- | 71 |
| Total | 81 | 1,466 | 260 | 1,726 | 401 | 131 | 532 |
| Vessels: | | | | | | | |
| Steam: | | | | | | | |
| 5 to 10 tons | ---------- | 1 | ---------- | 1 | ---------- | ---------- | ---------- |
| 11 to 20 tons | ---------- | 5 | ---------- | 5 | ---------- | ---------- | ---------- |
| 21 to 30 tons | ---------- | 3 | ---------- | 3 | ---------- | ---------- | ---------- |
| 31 to 40 tons | ---------- | 3 | ---------- | 3 | ---------- | ---------- | ---------- |
| 41 to 50 tons | ---------- | 1 | ---------- | 1 | ---------- | ---------- | ---------- |
| 51 to 60 tons | ---------- | 1 | ---------- | 1 | ---------- | ---------- | ---------- |
| Total | ---------- | 14 | ---------- | 14 | ---------- | ---------- | ---------- |
| Net tonnage | ---------- | 377 | ---------- | 377 | ---------- | ---------- | ---------- |
| Motor: | | | | | | | |
| 5 to 10 tons | 10 | 93 | 32 | 125 | ---------- | ---------- | ---------- |
| 11 to 20 tons | 9 | 66 | 3 | 69 | ---------- | ---------- | ---------- |
| 21 to 30 tons | 5 | 12 | 1 | 13 | ---------- | ---------- | ---------- |
| 31 to 40 tons | ---------- | 3 | ---------- | 3 | ---------- | ---------- | ---------- |
| 41 to 50 tons | ---------- | 1 | ---------- | 1 | ---------- | ---------- | ---------- |
| 51 to 60 tons | ---------- | 1 | ---------- | 1 | ---------- | ---------- | ---------- |
| Total | 24 | 176 | 36 | 212 | ---------- | ---------- | ---------- |
| Net tonnage | 326 | 2,140 | 283 | 2,423 | ---------- | ---------- | ---------- |
| Total vessels | 24 | 190 | 36 | 226 | ---------- | ---------- | ---------- |
| Total net tonnage | 326 | 2,517 | 283 | 2,800 | ---------- | ---------- | ---------- |
| Boats: | | | | | | | |
| Motor | 2 | 266 | 72 | 338 | 184 | 96 | 280 |
| Other | ---------- | 280 | 66 | 446 | 207 | 29 | 236 |
| Accessory boats | ---------- | 3 | 1 | 4 | 5 | ---------- | 5 |

## *Lake fisheries of the United States, 1937*—Continued

### OPERATING UNITS: BY STATES AND LAKES—Continued

| Item | Illinois—Lake Michigan | Wisconsin |  |  | Minnesota |  |  |
|---|---|---|---|---|---|---|---|
|  |  | Lake Michigan | Lake Superior | Total | Lake Superior | Lake of the Woods, Rainy Lake, and Namakan Lake | Total |
| Apparatus: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Haul seines |  | 57 |  | 57 |  |  |  |
| Length, yards |  | 20,969 |  | 20,969 |  |  |  |
| Gill nets: |  |  |  |  |  |  |  |
| "Shoal," 2⅛ to 3⅞ inches | 2,840 | 41,332 | 2,304 | 43,636 | 3,761 |  | 3,761 |
| Square yards | 568,000 | 9,771,400 | 518,928 | 10,290,328 | 1,084,773 |  | 1,084,773 |
| "Shoal," 4 to 7 inches | 1,725 | 22,623 | 3,212 | 25,835 | 1,241 | 264 | 1,505 |
| Square yards | 345,000 | 5,501,960 | 1,097,520 | 6,599,480 | 345,760 | 79,712 | 425,472 |
| Trammel nets |  | 2 |  | 2 |  |  |  |
| Square yards |  | 350 |  | 350 |  |  |  |
| Lines, trot |  | 747 | 186 | 933 | 708 |  | 708 |
| Hooks |  | 207,675 | 52,775 | 260,450 | 26,635 |  | 26,635 |
| Pound nets |  | 334 | 93 | 427 |  | 69 | 69 |
| Fyke nets |  | 1,586 | 15 | 1,601 |  | 98 | 98 |
| Crawfish pots |  | 850 |  | 850 |  |  |  |
| Crowfoot bars |  | 40 |  | 40 |  |  |  |

### OPERATING UNITS OF LAKE ONTARIO: BY GEAR [1]

| Item | Haul seines | Gill nets |  |  | Lines, trot | Trap nets | Fyke nets | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
|  |  | "Shoal," 2⅛ to 3⅞ inches | "Shoal," 4 to 7 inches | "Shoal," 10 to 14 inches |  |  |  |  |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels |  | 16 | 4 |  |  |  |  | 16 |
| On boats and shore: |  |  |  |  |  |  |  |  |
| Regular |  | 29 | 23 | 6 | 3 | 14 | 5 | 35 |
| Casual | 16 | 15 | 9 | 7 | 38 | 31 | 14 | 107 |
| Total | 16 | 60 | 36 | 13 | 41 | 45 | 19 | 158 |
| Vessels, motor: |  |  |  |  |  |  |  |  |
| 5 to 10 tons |  | 3 | 1 |  |  |  |  | 3 |
| 11 to 20 tons |  | 1 |  |  |  |  |  | 1 |
| Total |  | 4 | 1 |  |  |  |  | 4 |
| Net tonnage |  | 42 | 7 |  |  |  |  | 42 |
| Boats: |  |  |  |  |  |  |  |  |
| Motor | 3 | 21 | 16 | 6 | 11 | 18 | 6 | 46 |
| Other | 3 | 7 | 3 | 2 | 22 | 10 | 7 | 48 |
| Apparatus: |  |  |  |  |  |  |  |  |
| Number | 6 | 1,720 | 468 | 26 | 37 | 150 | 140 |  |
| Length, yards | 483 |  |  |  |  |  |  |  |
| Square yards |  | 231,064 | 83,200 | 15,730 |  |  |  |  |
| Hooks |  |  |  |  | 13,225 |  |  |  |

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[1] Includes Niagara River below the Falls and the St. Lawrence River.

*Lake fisheries of the United States, 1937*—Continued

OPERATING UNITS OF LAKE ERIE: BY GEAR[1]

| Item | Haul seines | Gill nets | | | Bar nets |
|---|---|---|---|---|---|
| | | "Shoal," 2⅛ to 3⅞ inches | "Shoal," 4 to 7 inches | "Shoal," 10 to 14 inches | |
| | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | |
| On vessels | ---------- | 254 | 224 | 5 | ---------- |
| On boats and shore: | | | | | |
| Regular | 118 | 47 | 41 | 1 | 12 |
| Casual | 174 | 42 | 15 | 1 | 7 |
| Total | 292 | 343 | 280 | 7 | 19 |
| Vessels: | | | | | |
| Steam: | | | | | |
| 11 to 20 tons | ---------- | 3 | 3 | ---------- | ---------- |
| 21 to 30 tons | ---------- | 7 | 7 | ---------- | ---------- |
| 31 to 40 tons | ---------- | 3 | 3 | ---------- | ---------- |
| 41 to 50 tons | ---------- | 2 | 1 | ---------- | ---------- |
| Total | ---------- | 15 | 14 | ---------- | ---------- |
| Net tonnage | ---------- | 401 | 354 | ---------- | ---------- |
| Motor: | | | | | |
| 5 to 10 tons | ---------- | 17 | 17 | ---------- | ---------- |
| 11 to 20 tons | ---------- | 13 | 9 | 1 | ---------- |
| 21 to 30 tons | ---------- | 1 | 1 | ---------- | ---------- |
| 31 to 40 tons | ---------- | 2 | 1 | ---------- | ---------- |
| Total | ---------- | 33 | 28 | 1 | ---------- |
| Net tonnage | ---------- | 395 | 304 | 15 | ---------- |
| Total vessels | ---------- | 48 | 42 | 1 | ---------- |
| Total net tonnage | ---------- | 796 | 658 | 15 | ---------- |
| Boats: | | | | | |
| Motor | 41 | 28 | 14 | 1 | 8 |
| Other | 135 | 9 | 5 | ---------- | 7 |
| Apparatus: | | | | | |
| Number | 128 | 15,771 | 10,026 | 20 | 113 |
| Length, yards | 63,928 | ---------- | ---------- | ---------- | ---------- |
| Square yards | ---------- | 1,991,744 | 2,069,838 | 9,328 | 4,649 |

| Item | Lines, trot | Pound nets | Trap nets | Fyke nets | Crowfoot bars | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | |
| On vessels | ---------- | ---------- | ---------- | ---------- | ---------- | 270 |
| On boats and shore: | | | | | | |
| Regular | 6 | 18 | 542 | 70 | ---------- | 732 |
| Casual | 27 | 7 | 46 | 39 | 4 | 311 |
| Total | 33 | 25 | 588 | 109 | 4 | 1,313 |
| Vessels: | | | | | | |
| Steam: | | | | | | |
| 11 to 20 tons | ---------- | ---------- | ---------- | ---------- | ---------- | 3 |
| 21 to 30 tons | ---------- | ---------- | ---------- | ---------- | ---------- | 7 |
| 31 to 40 tons | ---------- | ---------- | ---------- | ---------- | ---------- | 4 |
| 41 to 50 tons | ---------- | ---------- | ---------- | ---------- | ---------- | 2 |
| Total | ---------- | ---------- | ---------- | ---------- | ---------- | 16 |
| Net tonnage | ---------- | ---------- | ---------- | ---------- | ---------- | 433 |

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[1] Includes Niagara River above the Falls.

*Lake fisheries of the United States, 1937*—Continued

OPERATING UNITS OF LAKE ERIE: BY GEAR—Continued

| Item | Lines, trot | Pound nets | Trap nets | Fyke nets | Crowfoot bars | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| Vessels—Continued. | | | | | | |
| Motor: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| 5 to 10 tons | | | | | | 19 |
| 11 to 20 tons | | | | | | 13 |
| 21 to 30 tons | | | | | | 1 |
| 31 to 40 tons | | | | | | 2 |
| Total | | | | | | 35 |
| Net tonnage | | | | | | 409 |
| Total vessels | | | | | | 51 |
| Total net tonnage | | | | | | 842 |
| Boats: | | | | | | |
| Motor | 4 | 5 | 201 | 29 | 1 | 288 |
| Other | 26 | | 125 | 55 | 3 | 315 |
| Apparatus: | | | | | | |
| Number | 39 | 41 | 5,346 | 667 | 4 | |
| Hooks | 14,760 | | | | | |

OPERATING UNITS OF LAKE HURON: BY GEAR

| Item | Haul seines | Gill nets: "Shoal," 2⅛ to 3⅞ inches | Gill nets: "Shoal," 4 to 7 inches | Lines, trot | Pound nets | Trap nets | Fyke nets | Crowfoot bars | Picks | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | | | |
| On vessels | | 48 | 77 | 58 | 8 | 33 | | | | | 137 |
| On boats and shore: | | | | | | | | | | | |
| Regular | 78 | 95 | 120 | 26 | 192 | 501 | 38 | | | | 665 |
| Casual | 33 | 30 | 30 | 7 | 14 | 39 | 4 | 9 | 3 | 11 | 129 |
| Total | 111 | 173 | 227 | 91 | 214 | 573 | 42 | 9 | 3 | 11 | 931 |
| Vessels: | | | | | | | | | | | |
| Steam: | | | | | | | | | | | |
| 5 to 10 tons | | 1 | 1 | | | | | | | | 1 |
| 11 to 20 tons | | 1 | 3 | 1 | | | | | | | 3 |
| 21 to 30 tons | | 1 | | 1 | | | | | | | 1 |
| Total | | 3 | 4 | 2 | | | | | | | 5 |
| Net tonnage | | 53 | 55 | 41 | | | | | | | 81 |
| Motor: | | | | | | | | | | | |
| 5 to 10 tons | | 3 | 9 | 3 | 1 | 6 | | | | | 15 |
| 11 to 20 tons | | 2 | 5 | 3 | 1 | 3 | | | | | 8 |
| 21 to 30 tons | | 2 | 2 | 2 | | | | | | | 4 |
| 31 to 40 tons | | 1 | | 3 | | 1 | | | | | 3 |
| 51 to 60 tons | | | 1 | | | | | | | | 1 |
| Total | | 8 | 17 | 11 | 2 | 10 | | | | | 31 |
| Net tonnage | | 143 | 224 | 225 | 18 | 107 | | | | | 467 |
| Total vessels | | 11 | 21 | 13 | 2 | 10 | | | | | 36 |
| Total net tonnage | | 196 | 279 | 266 | 18 | 107 | | | | | 548 |
| Boats: | | | | | | | | | | | |
| Motor | 32 | 48 | 39 | 10 | 75 | 168 | 12 | 2 | 1 | | 246 |
| Other | 14 | 30 | 21 | 8 | 15 | 67 | 6 | 1 | 3 | 7 | 127 |
| Apparatus: | | | | | | | | | | | |
| Number | 55 | 2,775 | 5,618 | 577 | 418 | 2,903 | 192 | 3 | 7 | | |
| Length, yards | 27,173 | | | | | | | | | | |
| Square yards | | 544,900 | 1,477,400 | | | | | | | | |
| Hooks | | | | 171,000 | | | | | | | |

*Lake fisheries of the United States, 1937*—Continued

OPERATING UNITS OF LAKE MICHIGAN: BY GEAR

| Item | Haul seines | Gill nets | | Trammel nets | Lines, trot | Pound nets | Trap nets |
|---|---|---|---|---|---|---|---|
| | | "Shoal" 2⅛ to 3⅞ inches | "Shoal" 4 to 7 inches | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 4 | 869 | 734 | | 177 | 54 | 15 |
| On boats and shore: | | | | | | | |
| Regular | 71 | 490 | 335 | | 35 | 287 | 116 |
| Casual | 49 | 364 | 252 | 2 | 20 | 89 | 13 |
| Total | 124 | 1,723 | 1,321 | 2 | 232 | 430 | 144 |
| Vessels: | | | | | | | |
| Steam: | | | | | | | |
| 5 to 10 tons | | 3 | 1 | | | | |
| 11 to 20 tons | | 11 | 5 | | 2 | 1 | 1 |
| 21 to 30 tons | | 3 | 3 | | 1 | | |
| 31 to 40 tons | | 2 | 2 | | 1 | | |
| 41 to 50 tons | | 1 | | | | | |
| 51 to 60 tons | | 1 | 1 | | | | |
| Total | | 21 | 12 | | 4 | 1 | 1 |
| Net tonnage | | 429 | 282 | | 94 | 15 | 13 |
| Motor: | | | | | | | |
| 5 to 10 tons | 2 | 137 | 97 | | 17 | 18 | 1 |
| 11 to 20 tons | | 93 | 85 | | 25 | | 2 |
| 21 to 30 tons | | 22 | 24 | | 5 | 1 | |
| 31 to 40 tons | | 3 | 2 | | | | |
| 41 to 50 tons | | 1 | | | | | |
| 51 to 60 tons | | | 1 | | 1 | | |
| Total | 2 | 256 | 209 | | 48 | 19 | 3 |
| Net tonnage | 16 | 3,020 | 2,659 | | 695 | 138 | 33 |
| Total vessels | 2 | 277 | 221 | | 52 | 20 | 4 |
| Total net tonnage | 16 | 3,449 | 2,941 | | 789 | 153 | 46 |
| Boats: | | | | | | | |
| Motor | 24 | 246 | 143 | | 22 | 129 | 37 |
| Other | 62 | 220 | 118 | 2 | 18 | 112 | 26 |
| Accessory boats | 2 | 1 | | | | | |
| Apparatus: | | | | | | | |
| Number | 58 | 60,059 | 45,537 | 2 | 1,232 | 621 | 447 |
| Length, yards | 21,034 | | | | | | |
| Square yards | | 13,288,670 | 10,560,032 | 350 | | | |
| Hooks | | | | | 357,475 | | |

| Item | Fyke nets | Dip nets | Crawfish pots | Crowfoot bars | Picks | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 31 | | | | | | 1,042 |
| On boats and shore: | | | | | | | |
| Regular | 182 | | | | | | 790 |
| Casual | 47 | 2 | 5 | 136 | 30 | 25 | 826 |
| Total | 260 | 2 | 5 | 136 | 30 | 25 | 2,658 |
| Vessels: | | | | | | | |
| Steam: | | | | | | | |
| 5 to 10 tons | | | | | | | 3 |
| 11 to 20 tons | | | | | | | 11 |
| 21 to 30 tons | | | | | | | 5 |
| 31 to 40 tons | | | | | | | 3 |
| 41 to 50 tons | | | | | | | 1 |
| 51 to 60 tons | | | | | | | 1 |
| Total | | | | | | | 24 |
| Net tonnage | | | | | | | 523 |
| Motor: | | | | | | | |
| 5 to 10 tons | 11 | | | | | | 158 |
| 11 to 20 tons | 1 | | | | | | 112 |
| 21 to 30 tons | | | | | | | 27 |

*Lake fisheries of the United States, 1937*—Continued

OPERATING UNITS OF LAKE MICHIGAN: BY GEAR—Continued

| Item | Fyke nets | Dip nets | Crawfish pots | Crow-foot bars | Picks | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|
| Vessels—Continued. | | | | | | | |
| Motor—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| 31 to 40 tons | | | | | | | 3 |
| 41 to 50 tons | | | | | | | 1 |
| 51 to 60 tons | | | | | | | 1 |
| Total | 12 | | | | | | 302 |
| Net tonnage | 95 | | | | | | 3,656 |
| Total vessels | 12 | | | | | | 326 |
| Total net tonnage | 95 | | | | | | 4,179 |
| Boats: | | | | | | | |
| Motor | 83 | | 5 | 81 | 6 | | 493 |
| Other | 120 | | 3 | 50 | 13 | 22 | 550 |
| Accessory boats | | | | | | | 3 |
| Apparatus, number | 1,682 | 1 | 850 | 151 | 30 | | |

OPERATING UNITS OF LAKE SUPERIOR: BY GEAR

| Item | Haul seines | Gill nets | | Lines | | Pound nets | Trap nets | Fyke nets | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|
| | | "Shoal," 2⅛ to 3⅞ inches | "Shoal," 4 to 7 inches | Troll | Trot | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | | 114 | 136 | | 103 | 13 | 3 | | 197 |
| On boats and shore: | | | | | | | | | |
| Regular | 22 | 613 | 395 | 16 | 273 | 79 | 24 | 11 | 770 |
| Casual | 10 | 198 | 128 | 14 | 60 | 14 | 7 | 3 | 260 |
| Total | 32 | 925 | 659 | 30 | 436 | 106 | 34 | 14 | 1,227 |
| Vessels: | | | | | | | | | |
| Steam: | | | | | | | | | |
| 21 to 30 tons | | 1 | 3 | | 1 | 1 | | | 3 |
| 31 to 40 tons | | | 1 | | 1 | | | | 1 |
| Total | | 1 | 4 | | 2 | 1 | | | 4 |
| Net tonnage | | 24 | 109 | | 56 | 24 | | | 109 |
| Motor: | | | | | | | | | |
| 5 to 10 tons | | 31 | 33 | | 16 | 4 | 1 | | 45 |
| 11 to 20 tons | | 6 | 3 | | 8 | | | | 10 |
| 21 to 30 tons | | 2 | 4 | | 3 | | | | 4 |
| 31 to 40 tons | | | 2 | | 1 | | | | 2 |
| Total | | 39 | 42 | | 28 | 4 | 1 | | 61 |
| Net tonnage | | 347 | 436 | | 336 | 23 | 9 | | 626 |
| Total vessels | | 40 | 46 | | 30 | 5 | 1 | | 65 |
| Total net tonnage | | 371 | 545 | | 392 | 47 | 9 | | 735 |
| Boats: | | | | | | | | | |
| Motor | 7 | 364 | 259 | 8 | 173 | 34 | 9 | 4 | 468 |
| Other | 6 | 290 | 103 | | 41 | 18 | 3 | 6 | 339 |
| Accessory boats | | 5 | | | 1 | | | 1 | 6 |
| Apparatus: | | | | | | | | | |
| Number | 12 | 10,381 | 10,164 | 60 | 3,250 | 183 | 74 | 21 | |
| Length, yards | 1,553 | | | | | | | | |
| Square yards | | 2,361,396 | 3,330,868 | | | | | | |
| Hooks | | | | 400 | 666,110 | | | | |

*Lake fisheries of the United States, 1937*—Continued

OPERATING UNITS OF LAKE OF THE WOODS, RAINY LAKE, AND NAMAKAN LAKE: BY GEAR

| Item | Gill nets, "shoal," 4 to 7 inches | Pound nets | Fyke nets | Total, exclusive of duplication |
|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* |
| Fishermen, on boats and shore, regular | 91 | 35 | 32 | 131 |
| Boats: | | | | |
| Motor | 77 | 19 | 8 | 96 |
| Other | 14 | 20 | 12 | 29 |
| Apparatus: | | | | |
| Number | 264 | 69 | 98 | |
| Square yards | 79, 712 | | | |

CATCH: BY GEAR

| Species | New York | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Haul seines | | Gill nets | | Trot lines | | Trap nets | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Blue pike | | | 1, 695, 200 | $112, 314 | | | 2, 700 | $274 |
| Bowfin | | | | | | | 300 | 11 |
| Burbot | | | 7, 500 | 390 | | | 26, 100 | 1, 222 |
| Carp | 98, 800 | $4, 467 | 2, 300 | 100 | | | 11, 200 | 396 |
| Catfish and bullheads | 1, 200 | 117 | 1, 300 | 121 | | | 42, 900 | 3, 302 |
| Cisco | | | 5, 800 | 612 | | | | |
| Eels | | | | | | | 10, 100 | 505 |
| Garfish | 6, 400 | 32 | | | | | | |
| Lake herring | | | 108, 200 | 12, 951 | | | 15, 600 | 2, 109 |
| Lake trout | 7, 000 | 700 | 4, 800 | 613 | | | 3, 500 | 459 |
| Pike or pickerel (jacks) | 100 | 4 | 200 | 18 | | | 7, 700 | 591 |
| Rock bass | | | 100 | 1 | | | 7, 400 | 100 |
| Sauger | | | 600 | 30 | | | | |
| Sheepshead | | | | | | | 200 | 8 |
| Sturgeon | | | 1, 600 | 640 | 13, 500 | $4, 628 | 300 | 108 |
| Sucker "mullet" | 7, 200 | 409 | 10, 600 | 276 | | | 32, 500 | 981 |
| Sunfish | | | | | | | 30, 400 | 655 |
| White bass | | | 300 | 12 | | | | |
| Whitefish, common | | | 110, 400 | 21, 357 | | | 40, 500 | 6, 238 |
| Yellow perch | 100 | 5 | 54, 700 | 4, 660 | | | 22, 900 | 891 |
| Yellow pike | | | 700 | 99 | | | 8, 800 | 1, 128 |
| Total | 120, 800 | 5, 734 | 2, 004, 300 | 154, 194 | 13, 500 | 4, 628 | 263, 100 | 18, 978 |

| Species | New York—Continued | | | | Pennsylvania | |
|---|---|---|---|---|---|---|
| | Fyke Nets | | Total | | Gill nets | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Blue pike | | | 1, 697, 900 | $112, 588 | 2, 164, 100 | $118, 802 |
| Bowfin | | | 300 | 11 | | |
| Burbot | 2, 100 | $81 | 35, 700 | 1, 693 | 10, 000 | 67 |
| Carp | 2, 700 | 81 | 115, 000 | 5, 044 | | |
| Catfish and bullheads | 24, 400 | 2, 098 | 69, 800 | 5, 638 | 1, 500 | 75 |
| Cisco | | | 5, 800 | 612 | 52, 100 | 5, 230 |
| Eels | | | 10, 100 | 505 | | |
| Garfish | | | 6, 400 | 32 | | |
| Lake herring | | | 123, 800 | 15, 060 | | |
| Lake trout | | | 15, 300 | 1, 772 | 200 | 28 |
| Pike or pickerel (jacks) | 1, 400 | 86 | 9, 400 | 699 | | |
| Rock bass | | | 7, 500 | 101 | | |
| Sauger | | | 600 | 30 | | |
| Sheepshead | | | 200 | 8 | 3, 600 | 47 |
| Sturgeon | | | 15, 400 | 5, 376 | 100 | 31 |
| Sucker "mullet" | 12, 000 | 553 | 62, 300 | 2, 219 | 3, 900 | 60 |
| Sunfish | 2, 100 | 54 | 32, 500 | 709 | | |
| White bass | | | 300 | 12 | 4, 600 | 201 |
| Whitefish, common | | | 150, 900 | 27, 595 | 375, 800 | 82, 171 |
| Yellow perch | 4, 900 | 193 | 82, 600 | 5, 749 | 83, 400 | 5, 254 |
| Yellow pike | | | 9, 500 | 1, 227 | 200 | 23 |
| Total | 49, 600 | 3, 146 | 2, 451, 300 | 186, 680 | 2, 699, 500 | 211, 989 |

## *Lake fisheries of the United States, 1937*—Continued

### CATCH: BY GEAR—Continued

| Species | Pennsylvania—Continued | | | | Ohio | | | |
|---|---|---|---|---|---|---|---|---|
| | Pound nets | | Total | | Haul seines | | Gill nets | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Blue pike | 139,400 | $7,670 | 2,303,500 | $126,472 | 100 | $8 | 993,000 | $57,591 |
| Burbot | 2,000 | 14 | 12,000 | 81 | 300 | 3 | 1,200 | 12 |
| Carp | 3,200 | 57 | 3,200 | 57 | 1,196,300 | 20,337 | 11,300 | 193 |
| Catfish and bullheads | 2,800 | 139 | 4,300 | 214 | 247,300 | 16,076 | 1,500 | 98 |
| Cisco | 4,600 | 468 | 56,700 | 5,698 | -------- | -------- | 900 | 92 |
| Goldfish | -------- | -------- | -------- | -------- | 247,700 | 4,954 | -------- | -------- |
| Lake trout | -------- | -------- | 200 | 28 | -------- | -------- | -------- | -------- |
| Mooneye | -------- | -------- | -------- | -------- | 7,300 | 138 | -------- | -------- |
| Sauger | -------- | -------- | -------- | -------- | 3,800 | 223 | 374,200 | 21,701 |
| Sheepshead | 20,300 | 281 | 23,900 | 328 | 649,700 | 10,395 | 7,600 | 121 |
| Sturgeon | 300 | 80 | 400 | 111 | -------- | -------- | -------- | -------- |
| Sucker "mullet" | 5,200 | 78 | 9,100 | 138 | 36,700 | 624 | 25,000 | 426 |
| White bass | 25,200 | 1,114 | 29,800 | 1,315 | 32,200 | 1,352 | 2,900 | 123 |
| Whitefish, common | 53,600 | 11,695 | 429,400 | 93,866 | -------- | -------- | 24,400 | 4,877 |
| Yellow perch | 21,400 | 1,364 | 104,800 | 6,618 | 900 | 58 | 970,100 | 61,119 |
| Yellow pike | 29,500 | 3,902 | 29,700 | 3,925 | 11,100 | 888 | 59,000 | 4,720 |
| Total | 307,500 | 26,862 | 3,007,000 | 238,851 | 2,433,400 | 55,056 | 2,471,100 | 151,073 |

| Species | Ohio—Continued | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Bar nets | | Trap nets | | Fyke nets | | Total | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Blue pike | -------- | -------- | 5,974,700 | $346,533 | 51,700 | $2,999 | 7,019,500 | $407,131 |
| Burbot | -------- | -------- | 355,700 | 3,557 | 300 | 3 | 357,500 | 3,575 |
| Carp | 110,500 | $1,879 | 181,900 | 3,092 | 43,700 | 742 | 1,543,700 | 26,243 |
| Catfish and bullheads | 100 | 6 | 462,000 | 30,030 | 44,100 | 2,870 | 755,000 | 49,080 |
| Cisco | -------- | -------- | 600 | 60 | -------- | -------- | 1,500 | 152 |
| Goldfish | 2,700 | 54 | 7,900 | 158 | 2,900 | 58 | 261,200 | 5,224 |
| Mooneye | -------- | -------- | 7,100 | 135 | 500 | 9 | 14,900 | 282 |
| Sauger | -------- | -------- | 768,700 | 44,585 | 25,500 | 1,479 | 1,172,200 | 67,988 |
| Sheepshead | 300 | 5 | 3,119,100 | 49,906 | 183,400 | 2,934 | 3,960,100 | 63,361 |
| Sturgeon | -------- | -------- | 2,300 | 686 | -------- | -------- | 2,300 | 686 |
| Sucker "mullet" | -------- | -------- | 888,000 | 15,096 | 61,600 | 1,047 | 1,011,300 | 17,193 |
| White bass | -------- | -------- | 285,600 | 11,995 | 58,300 | 2,449 | 379,000 | 15,919 |
| Whitefish, common | -------- | -------- | 98,600 | 19,720 | 200 | 40 | 123,200 | 24,637 |
| Yellow perch | -------- | -------- | 618,000 | 38,934 | 6,800 | 428 | 1,595,800 | 100,539 |
| Yellow pike | -------- | -------- | 2,695,000 | 215,690 | 125,100 | 10,008 | 2,890,200 | 231,306 |
| Total | 113,600 | 1,944 | 15,465,200 | 780,177 | 604,100 | 25,066 | 21,087,400 | 1,013,316 |

| Species | Michigan | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Haul seines | | Gill nets | | Lines | | | |
| | | | | | Troll | | Trot | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | 100 | $2 | -------- | -------- | -------- | -------- | -------- | -------- |
| Burbot | 100 | 2 | 5,200 | $102 | -------- | -------- | 400 | $7 |
| Carp | 1,115,000 | 33,449 | 14,100 | 423 | -------- | -------- | 400 | 12 |
| Catfish and bullheads | 50,700 | 2,953 | 400 | 26 | -------- | -------- | 3,900 | 253 |
| Chubs | -------- | -------- | 1,301,800 | 195,269 | -------- | -------- | -------- | -------- |
| Lake herring | 45,700 | 1,370 | 4,646,200 | 139,385 | -------- | -------- | -------- | -------- |
| Lake trout | -------- | -------- | 4,034,100 | 605,108 | 38,500 | $5,779 | 1,521,500 | 228,216 |
| Pike or pickerel (jacks) | 400 | 35 | 1,200 | 98 | -------- | -------- | -------- | -------- |
| Rock bass | 6,500 | 261 | 100 | 4 | -------- | -------- | -------- | -------- |
| Sauger | 200 | 14 | 1,200 | 69 | -------- | -------- | -------- | -------- |
| Sheepshead | 10,600 | 212 | 100 | 2 | -------- | -------- | 2,500 | 50 |
| Smelt | -------- | -------- | 50,000 | 1,500 | -------- | -------- | -------- | -------- |
| Sucker "mullet" | 141,000 | 4,229 | 406,500 | 12,195 | -------- | -------- | -------- | -------- |
| White bass | 100 | 10 | -------- | -------- | -------- | -------- | -------- | -------- |
| Whitefish: | | | | | | | | |
| Common | -------- | -------- | 866,100 | 181,892 | -------- | -------- | -------- | -------- |
| Menominee | -------- | -------- | 94,800 | 8,533 | -------- | -------- | -------- | -------- |
| Yellow perch | 25,400 | 2,541 | 529,800 | 52,980 | -------- | -------- | 2,900 | 291 |
| Yellow pike | 85,100 | 11,918 | 69,100 | 9,674 | -------- | -------- | 100 | 14 |
| Total | 1,480,900 | 56,996 | 12,020,700 | 1,207,260 | 38,500 | 5,779 | 1,531,700 | 228,843 |

*Lake fisheries of the United States, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Michigan—Continued | | | | | |
|---|---|---|---|---|---|---|
| | Pound nets | | Trap nets | | Fyke nets | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | | | 100 | $2 | 500 | $10 |
| Burbot | 300 | $6 | 1,200 | 24 | 200 | 4 |
| Carp | 5,600 | 168 | 141,500 | 4,245 | 303,100 | 9,092 |
| Catfish and bullheads | 700 | 41 | 86,300 | 5,584 | 47,700 | 1,690 |
| Chubs | 200 | 30 | 100 | 15 | | |
| Goldfish | | | | | 6,200 | 186 |
| Lake herring | 3,590,200 | 107,705 | 1,495,300 | 44,860 | 11,600 | 348 |
| Lake trout | 139,600 | 20,949 | 158,600 | 23,692 | 2,400 | 356 |
| Pike or pickerel (jacks) | 1,700 | 136 | 17,200 | 1,378 | 11,000 | 878 |
| Rock bass | 1,700 | 68 | 11,700 | 467 | 9,600 | 386 |
| Sauger | 200 | 12 | 5,000 | 303 | 41,100 | 2,466 |
| Sheepshead | 3,100 | 62 | 10,400 | 208 | 57,700 | 1,154 |
| Smelt | 142,500 | 4,275 | 1,600 | 48 | | |
| Sucker "mullet" | 113,100 | 3,391 | 2,912,900 | 87,388 | 326,300 | 9,800 |
| White bass | | | | | 25,900 | 2,590 |
| Whitefish: | | | | | | |
| Common | 469,500 | 98,606 | 884,100 | 185,660 | 4,100 | 863 |
| Menominee | 5,200 | 468 | 19,300 | 1,737 | | |
| Yellow perch | 20,900 | 2,092 | 449,300 | 44,925 | 106,200 | 10,623 |
| Yellow pike | 70,100 | 9,820 | 1,411,900 | 197,661 | 206,400 | 28,891 |
| Total | 4,564,600 | 247,829 | 7,606,500 | 598,197 | 1,160,000 | 69,337 |

| Species | Michigan—Continued | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Crowfoot bars | | Picks | | By hand | | Total | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | | | | | | | 700 | $14 |
| Burbot | | | | | | | 7,400 | 145 |
| Carp | | | | | | | 1,579,700 | 47,389 |
| Catfish and bullheads | | | | | | | 189,700 | 10,547 |
| Chubs | | | | | | | 1,302,100 | 195,314 |
| Goldfish | | | | | | | 6,200 | 186 |
| Lake herring | | | | | | | 9,789,000 | 293,668 |
| Lake trout | | | | | | | 5,894,700 | 884,100 |
| Pike or pickerel (jacks) | | | | | | | 31,500 | 2,525 |
| Rock bass | | | | | | | 29,600 | 1,186 |
| Sauger | | | | | | | 47,700 | 2,864 |
| Sheepshead | | | | | | | 84,400 | 1,688 |
| Smelt | | | | | | | 194,100 | 5,823 |
| Sucker "mullet" | | | | | | | 3,899,800 | 117,003 |
| White bass | | | | | | | 26,000 | 2,600 |
| Whitefish: | | | | | | | | |
| Common | | | | | | | 2,223,800 | 467,021 |
| Menominee | | | | | | | 119,300 | 10,738 |
| Yellow perch | | | | | | | 1,134,500 | 113,452 |
| Yellow pike | | | | | | | 1,842,700 | 257,978 |
| Mussel shells [1] | 396,900 | $13,320 | 109,100 | $3,791 | 75,500 | $2,731 | 581,500 | 19,842 |
| Pearls and slugs [1] | | 389 | | 71 | | 64 | | 524 |
| Total | 396,900 | 13,709 | 109,100 | 3,862 | 75,500 | 2,795 | 28,984,400 | 2,434,607 |

| Species | Indiana | | | | | | Illinois | |
|---|---|---|---|---|---|---|---|---|
| | Gill nets | | Pound nets | | Total | | Gill nets | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Burbot | 15,000 | $300 | | | 15,000 | $300 | | |
| Chubs | 270,000 | 40,500 | | | 270,000 | 40,500 | 590,900 | $88,635 |
| Lake herring | 220,000 | 6,600 | 16,000 | $480 | 236,000 | 7,080 | 102,700 | 3,080 |
| Lake trout | 100,000 | 20,000 | | | 100,000 | 20,000 | 271,200 | 51,247 |
| Smelt | 100 | 3 | | | 100 | 3 | | |
| Sucker "mullet" | 500 | 15 | 2,000 | 60 | 2,500 | 75 | | |
| Whitefish, common | 100 | 25 | 3,000 | 600 | 3,100 | 625 | 700 | 150 |
| Yellow perch | 150,000 | 15,000 | 4,000 | 400 | 154,000 | 15,400 | 496,100 | 49,610 |
| Total | 755,700 | 82,443 | 25,000 | 1,540 | 780,700 | 83,983 | 1,461,600 | 192,722 |

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[1] From tributary streams.

*Lake fisheries of the United States, 1937*—Continued

CATCH: BY GEAR—Continued

| Species | Wisconsin | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Haul seines | | Gill nets | | Trammel nets | | Trot lines | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Burbot | -------- | -------- | 15,000 | $291 | -------- | -------- | 2,400 | $48 |
| Carp | 1,774,100 | $53,221 | 73,500 | 2,206 | 200 | $6 | -------- | -------- |
| Catfish and bullheads | 8,600 | 600 | 300 | 13 | -------- | -------- | -------- | -------- |
| Chubs | -------- | -------- | 3,767,800 | 565,175 | -------- | -------- | -------- | -------- |
| Lake herring | -------- | -------- | 4,601,800 | 137,956 | -------- | -------- | -------- | -------- |
| Lake trout | -------- | -------- | 1,912,100 | 345,437 | -------- | -------- | 557,300 | 111,110 |
| Pike or pickerel (jacks) | -------- | -------- | 2,500 | 198 | -------- | -------- | -------- | -------- |
| Smelt | -------- | -------- | 876,500 | 43,827 | -------- | -------- | -------- | -------- |
| Sucker "mullet" | 2,800 | 83 | 408,700 | 12,259 | 100 | 3 | -------- | -------- |
| Whitefish: | | | | | | | | |
| Common | -------- | -------- | 66,400 | 13,406 | -------- | -------- | -------- | -------- |
| Menominee | -------- | -------- | 11,800 | 1,178 | -------- | -------- | -------- | -------- |
| Yellow perch | -------- | -------- | 368,900 | 36,893 | -------- | -------- | 100 | 10 |
| Total | 1,785,500 | 53,904 | 12,105,300 | 1,158,839 | 300 | 9 | 559,800 | 111,168 |

| Species | Wisconsin—Continued | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Pound nets | | Fyke nets | | Crawfish pots | | Crowfoot bars | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Burbot | 1,200 | $24 | 900 | $18 | -------- | -------- | -------- | -------- |
| Carp | 2,200 | 64 | 50,800 | 1,523 | -------- | -------- | -------- | -------- |
| Catfish and bullheads | 4,400 | 145 | 43,200 | 1,342 | -------- | -------- | -------- | -------- |
| Chubs | 57,500 | 8,622 | -------- | -------- | -------- | -------- | -------- | -------- |
| Lake herring | 1,077,600 | 32,326 | 3,800 | 114 | -------- | -------- | -------- | -------- |
| Lake trout | 323,300 | 64,418 | -------- | -------- | -------- | -------- | -------- | -------- |
| Pike or pickerel (jacks), | 19,200 | 1,556 | 1,200 | 94 | -------- | -------- | -------- | -------- |
| Sheepshead | 300 | 6 | 100 | 2 | -------- | -------- | -------- | -------- |
| Smelt | 338,800 | 17,079 | 16,000 | 804 | -------- | -------- | -------- | -------- |
| Sucker "mullet" | 84,700 | 2,538 | 222,800 | 6,682 | -------- | -------- | -------- | -------- |
| White bass | -------- | -------- | 300 | 30 | -------- | -------- | -------- | -------- |
| Whitefish: | | | | | | | | |
| Common | 155,000 | 31,089 | -------- | -------- | -------- | -------- | -------- | -------- |
| Menominee | 1,900 | 190 | -------- | -------- | -------- | -------- | -------- | -------- |
| Yellow perch | 40,200 | 4,031 | 868,100 | 86,801 | -------- | -------- | -------- | -------- |
| Crawfish | -------- | -------- | -------- | -------- | 6,400 | $642 | -------- | -------- |
| Mussel shells [1] | -------- | -------- | -------- | -------- | -------- | -------- | 238,300 | $5.018 |
| Total | 2,106,300 | 162,088 | 1,207,200 | 97,410 | 6,400 | 642 | 238,300 | 5,018 |

| Species | Wisconsin—Continued | | | | Minnesota | |
|---|---|---|---|---|---|---|
| | By hand | | Total | | Gill nets | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Burbot | -------- | -------- | 19,500 | $381 | 7,600 | $112 |
| Carp | -------- | -------- | 1,900,800 | 57,020 | 3,700 | 181 |
| Catfish and bullheads | -------- | -------- | 56,500 | 2,100 | 1,700 | 109 |
| Chubs | -------- | -------- | 3,825,300 | 573,797 | 56,200 | 4,790 |
| Lake herring | -------- | -------- | 5,683,200 | 170,396 | 5,622,700 | 131,970 |
| Lake trout | -------- | -------- | 2,792,700 | 520,965 | 257,800 | 31,829 |
| Pike or pickerel (jacks) | -------- | -------- | 22,900 | 1,848 | 114,600 | 4,030 |
| Sauger | -------- | -------- | -------- | -------- | 309,600 | 11,517 |
| Sheepshead | -------- | -------- | 400 | 8 | -------- | -------- |
| Smelt | -------- | -------- | 1,231,300 | 61,710 | -------- | -------- |
| Sucker "mullet" | -------- | -------- | 719,100 | 21,565 | 87,000 | 1,142 |
| Tullibees | -------- | -------- | -------- | -------- | 185,200 | 3,883 |
| White bass | -------- | -------- | 300 | 30 | -------- | -------- |
| Whitefish | | | | | | |
| Common | -------- | -------- | 221,400 | 44,495 | 53,000 | 6,274 |
| Menominee | -------- | -------- | 13,700 | 1,368 | 4,600 | 460 |
| Yellow perch | -------- | -------- | 1,277,300 | 127,735 | 174,400 | 10,638 |
| Yellow pike | -------- | -------- | -------- | -------- | 383,000 | 25,626 |
| Crawfish | -------- | -------- | 6,400 | 642 | -------- | -------- |
| Mussel shells [1] | 26,700 | $573 | 265,000 | 5,591 | -------- | -------- |
| Total | 26,700 | 573 | 18,035,800 | 1,589,651 | 7,261,100 | 232.561 |

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[1] From tributary streams.

## *Lake fisheries of the United States, 1937*—Continued

### CATCH: By gear—Continued

| Species | Minnesota—Continued | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Trot lines | | Pound nets | | Fyke nets | | Total | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Burbot | | | 39,000 | $593 | 800 | $23 | 47,400 | $728 |
| Carp | | | 12,100 | 197 | 1,700 | 23 | 17,500 | 401 |
| Catfish and bullheads | | | 2,600 | 281 | 39,900 | 2,656 | 44,200 | 3,046 |
| Chubs | | | | | | | 56,200 | 4,790 |
| Crappie | | | 100 | 12 | 100 | 15 | 200 | 27 |
| Lake herring | | | | | | | 5,622,700 | 131,970 |
| Lake trout | 96,000 | $10,760 | | | | | 353,800 | 42,589 |
| Pike or pickerel (jacks) | | | 57,900 | 2,214 | 21,900 | 759 | 194,400 | 7,003 |
| Sauger | | | 77,700 | 3,380 | 27,700 | 1,310 | 415,000 | 16,207 |
| Sucker "mullet" | | | 58,100 | 764 | 43,100 | 576 | 188,200 | 2,482 |
| Tullibees | | | 25,500 | 290 | 12,600 | 498 | 223,300 | 4,671 |
| Whitefish: | | | | | | | | |
| Common | | | 22,500 | 3,343 | 200 | 21 | 75,700 | 9,638 |
| Menominee | | | | | | | 4,600 | 460 |
| Yellow perch | | | 19,400 | 1,103 | 27,700 | 1,742 | 221,500 | 13,483 |
| Yellow pike | | | 253,000 | 25,809 | 49,500 | 4,344 | 685,500 | 55,779 |
| Total | 96,000 | 10,760 | 567,900 | 37,986 | 225,200 | 11,967 | 8,150,200 | 293,274 |

### CATCH: By lakes

| Species | Lake Ontario | | Lake Erie | | | |
|---|---|---|---|---|---|---|
| | New York | | New York | | Pennsylvania | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Blue pike | 60,100 | $4,610 | 1,637,800 | $107,978 | 2,303,500 | $126,472 |
| Bowfin | 300 | 11 | | | | |
| Burbot | 35,700 | 1,693 | | | 12,000 | 81 |
| Carp | 86,200 | 3,376 | 28,800 | 1,668 | 3,200 | 57 |
| Catfish and bullheads | 68,700 | 5,541 | 1,100 | 97 | 4,300 | 214 |
| Cisco | | | 5,800 | 612 | 56,700 | 5,698 |
| Eels | 10,100 | 505 | | | | |
| Garfish | | | 6,400 | 32 | | |
| Lake herring | 123,800 | 15,060 | | | | |
| Lake trout | 12,900 | 1,532 | 2,400 | 240 | 200 | 28 |
| Pike or pickerel (jacks) | 9,400 | 699 | | | | |
| Rock bass | 7,400 | 100 | 100 | 1 | | |
| Sauger | | | 600 | 30 | | |
| Sheepshead | | | 200 | 8 | 23,900 | 328 |
| Sturgeon | 12,300 | 4,348 | 3,100 | 1,028 | 400 | 111 |
| Sucker "mullet" | 49,400 | 1,581 | 12,900 | 638 | 9,100 | 138 |
| Sunfish | 32,500 | 709 | | | | |
| White bass | | | 300 | 12 | 29,800 | 1,315 |
| Whitefish, common | 56,700 | 8,880 | 94,200 | 18,715 | 429,400 | 93,866 |
| Yellow perch | 49,000 | 3,192 | 33,600 | 2,557 | 104,800 | 6,618 |
| Yellow pike | 3,900 | 559 | 5,600 | 668 | 29,700 | 3,925 |
| Total | 618,400 | 52,396 | 1,832,900 | 134,284 | 3,007,000 | 238,851 |

*Lake fisheries of the United States, 1937*—Continued

CATCH: BY LAKES—Continued

| Species | Lake Erie—Continued | | | | | |
|---|---|---|---|---|---|---|
| | Ohio | | Michigan | | Total | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Blue pike | 7, 019, 500 | $407, 131 | ----- | ----- | 10, 960, 800 | $641, 581 |
| Burbot | 357, 500 | 3, 575 | 200 | $4 | 369, 700 | 3, 660 |
| Carp | 1, 543, 700 | 26, 243 | 577, 400 | 17, 322 | 2, 153, 100 | 45, 290 |
| Catfish and bullheads | 755, 000 | 49, 080 | 44, 000 | 1, 753 | 804, 400 | 51, 144 |
| Cisco | 1, 500 | 152 | ----- | ----- | 64, 000 | 6, 462 |
| Garfish | ----- | ----- | ----- | ----- | 6, 400 | 32 |
| Goldfish | 261, 200 | 5, 224 | 6, 200 | 186 | 267, 400 | 5, 410 |
| Lake trout | ----- | ----- | ----- | ----- | 2, 600 | 268 |
| Mooneye | 14, 900 | 282 | ----- | ----- | 14, 900 | 282 |
| Pike or pickerel (jacks) | ----- | ----- | 3, 500 | 280 | 3, 500 | 280 |
| Rock bass | ----- | ----- | 3, 200 | 128 | 3, 300 | 129 |
| Sauger | 1, 172, 200 | 67, 988 | 41, 500 | 2, 490 | 1, 214, 300 | 70, 508 |
| Sheepshead | 3, 960, 100 | 63, 361 | 75, 000 | 1, 500 | 4, 059, 200 | 65, 197 |
| Sturgeon | 2, 300 | 686 | ----- | ----- | 5, 800 | 1, 825 |
| Sucker "mullet" | 1, 011, 300 | 17, 193 | 70, 000 | 2, 100 | 1, 103, 300 | 20, 069 |
| White bass | 379, 000 | 15, 919 | 26, 000 | 2, 600 | 435, 100 | 19, 846 |
| Whitefish, common | 123, 200 | 24, 637 | 700 | 147 | 647, 500 | 137, 365 |
| Yellow perch | 1, 595, 800 | 100, 539 | 16, 000 | 1, 600 | 1, 750, 200 | 111, 314 |
| Yellow pike | 2, 890, 200 | 231, 306 | 134, 500 | 18, 830 | 3, 060, 000 | 254, 729 |
| Mussel shells [1] | ----- | ----- | 7, 100 | 229 | 7, 100 | 229 |
| Pearls and slugs [1] | ----- | ----- | ----- | 28 | ----- | 28 |
| Total | 21, 087, 400 | 1, 013, 316 | 1, 005, 300 | 49, 197 | 26, 932, 600 | 1, 435, 648 |

| Species | Lake Huron | | Lake Michigan | | | |
|---|---|---|---|---|---|---|
| | Michigan | | Michigan | | Indiana | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | 700 | $14 | ----- | ----- | ----- | ----- |
| Burbot | 800 | 15 | 5, 800 | $116 | 15, 000 | $300 |
| Carp | 978, 100 | 29, 341 | 24, 200 | 726 | ----- | ----- |
| Catfish and bullheads | 143, 500 | 8, 712 | 2, 200 | 82 | ----- | ----- |
| Chubs | 190, 300 | 28, 545 | 1, 050, 300 | 157, 545 | 270, 000 | 40, 500 |
| Lake herring | 4, 150, 000 | 124, 498 | 2, 468, 700 | 74, 061 | 236, 000 | 7, 080 |
| Lake trout | 1, 340, 200 | 201, 015 | 2, 263, 300 | 339, 495 | 100, 000 | 20, 000 |
| Pike or pickerel (jacks) | 13, 100 | 1, 053 | 13, 900 | 1, 112 | ----- | ----- |
| Rock bass | 24, 900 | 998 | 1, 500 | 60 | ----- | ----- |
| Sauger | 5, 800 | 350 | 300 | 18 | ----- | ----- |
| Sheepshead | 4, 200 | 84 | 5, 200 | 104 | ----- | ----- |
| Smelt | ----- | ----- | 194, 100 | 5, 823 | 100 | 3 |
| Sucker "mullet" | 1, 725, 900 | 51, 777 | 1, 725, 600 | 51, 777 | 2, 500 | 75 |
| Whitefish: | | | | | | |
| Common | 1, 018, 700 | 213, 923 | 946, 500 | 198, 765 | 3, 100 | 625 |
| Menominee | 72, 100 | 6, 490 | 37, 000 | 3, 330 | ----- | ----- |
| Yellow perch | 547, 600 | 54, 764 | 563, 000 | 56, 300 | 154, 000 | 15, 400 |
| Yellow pike | 1, 626, 700 | 227, 737 | 78, 000 | 10, 920 | ----- | ----- |
| Mussel shells [1] | 52, 400 | 1, 737 | 522, 000 | 17, 876 | ----- | ----- |
| Pearls and slugs [1] | ----- | 63 | ----- | 433 | ----- | ----- |
| Total | 11, 895, 000 | 951, 116 | 9, 901, 600 | 918, 543 | 780, 700 | 83, 983 |

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[1] From tributary streams.

MARINE BIOLOGICAL LABORATORY
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*Lake fisheries of the United States, 1937*—Continued

CATCH: BY LAKES—Continued

| Species | Lake Michigan—Continued | | | | | |
|---|---|---|---|---|---|---|
| | Illinois | | Wisconsin | | Total | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Burbot | | | 18,700 | $365 | 39,500 | $781 |
| Carp | | | 1,900,600 | 57,014 | 1,924,800 | 57,740 |
| Catfish and bullheads | | | 56,400 | 2,093 | 58,600 | 2,175 |
| Chubs | 590,900 | $88,635 | 3,668,000 | 550,189 | 5,579,200 | 836,869 |
| Lake herring | 102,700 | 3,080 | 2,692,100 | 80,767 | 5,499,500 | 164,988 |
| Lake trout | 271,200 | 51,247 | 2,352,800 | 435,569 | 4,987,300 | 846,311 |
| Pike or pickerel (jacks) | | | 100 | 8 | 14,000 | 1,120 |
| Rock bass | | | | | 1,500 | 60 |
| Sauger | | | | | 300 | 18 |
| Sheepshead | | | 400 | 8 | 5,600 | 112 |
| Smelt | | | 1,231,300 | 61,710 | 1,425,500 | 67,536 |
| Sucker "mullet" | | | 653,300 | 19,594 | 2,381,400 | 71,446 |
| White bass | | | 300 | 30 | 300 | 30 |
| Whitefish: | | | | | | |
| Common | 700 | 150 | 122,300 | 25,284 | 1,072,600 | 224,824 |
| Menominee | | | 10,300 | 1,028 | 47,300 | 4,358 |
| Yellow perch | 496,100 | 49,610 | 1,276,200 | 127,621 | 2,489,300 | 248,931 |
| Yellow pike | | | | | 78,000 | 10,920 |
| Crawfish | | | 6,400 | 642 | 6,400 | 642 |
| Mussel shells[1] | | | 265,000 | 5,591 | 787,000 | 23,467 |
| Pearls and slugs[1] | | | | | | 433 |
| Total | 1,461,600 | 192,722 | 14,254,200 | 1,367,513 | 26,398,100 | 2,562,761 |

| Species | Lake Superior | | | | | |
|---|---|---|---|---|---|---|
| | Michigan | | Wisconsin | | Minnesota | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Burbot | 600 | $10 | 800 | $16 | | |
| Carp | | | 200 | 6 | | |
| Catfish and bullheads | | | 100 | 7 | | |
| Chubs | 61,500 | 9,224 | 157,300 | 23,608 | 56,200 | $4,790 |
| Lake herring | 3,170,300 | 95,109 | 2,991,100 | 89,629 | 5,622,700 | 131,970 |
| Lake trout | 2,291,200 | 343,590 | 439,900 | 85,396 | 353,800 | 42,589 |
| Pike or pickerel (jacks) | 1,000 | 80 | 22,800 | 1,840 | 300 | 21 |
| Sauger | 100 | 6 | | | | |
| Sucker "mullet" | 378,300 | 11,349 | 65,800 | 1,971 | 3,000 | 90 |
| Whitefish: | | | | | | |
| Common | 257,900 | 54,186 | 99,100 | 19,211 | 6,600 | 1,050 |
| Menominee | 10,200 | 918 | 3,400 | 340 | 4,600 | 460 |
| Yellow perch | 7,900 | 788 | 1,100 | 114 | | |
| Yellow pike | 3,500 | 491 | | | | |
| Total | 6,182,500 | 515,751 | 3,781,600 | 222,138 | 6,047,200 | 180,970 |

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[1] From tributary streams.

## *Lake fisheries of the United States, 1937*—Continued

### CATCH: BY LAKES—Continued

| Species | Lake Superior—Contd. | | Lake of the Woods, Rainy Lake, and Namakan Lake | | Total, all lakes | |
|---|---|---|---|---|---|---|
| | Total | | Minnesota | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Blue pike | | | | | 11, 020, 900 | $646, 191 |
| Bowfin | | | | | 1, 000 | 25 |
| Burbot | 1, 400 | $26 | 47, 400 | $728 | 494, 500 | 6, 903 |
| Carp | 200 | 6 | 17, 500 | 401 | 5, 159, 900 | 136, 154 |
| Catfish and bullheads | 100 | 7 | 44, 200 | 3, 046 | 1, 119, 500 | 70, 625 |
| Chubs | 275, 000 | 37, 622 | | | 6, 044, 500 | 903, 036 |
| Cisco | | | | | 64, 000 | 6, 462 |
| Crappie | | | 200 | 27 | 200 | 27 |
| Eels | | | | | 10, 100 | 505 |
| Garfish | | | | | 6, 400 | 32 |
| Goldfish | | | | | 267, 400 | 5, 410 |
| Lake herring | 11, 784, 100 | 316, 708 | | | 21, 557, 400 | 621, 254 |
| Lake trout | 3, 084, 900 | 471, 575 | | | 9, 427, 900 | 1, 520, 701 |
| Mooneye | | | | | 14, 900 | 282 |
| Pike or pickerel (jacks) | 24, 100 | 1, 941 | 194, 100 | 6, 982 | 258, 200 | 12, 075 |
| Rock bass | | | | | 37, 100 | 1, 287 |
| Sauger | 100 | 6 | 415, 000 | 16, 207 | 1, 635, 500 | 87, 089 |
| Sheepshead | | | | | 4, 069, 000 | 65, 393 |
| Smelt | | | | | 1, 425, 500 | 67, 536 |
| Sturgeon | | | | | 18, 100 | 6, 173 |
| Sucker "mullet" | 447, 100 | 13, 410 | 185, 200 | 2, 392 | 5, 892, 300 | 160, 675 |
| Sunfish | | | | | 32, 500 | 709 |
| Tullibees | | | 223, 300 | 4, 671 | 223, 300 | 4, 671 |
| White bass | | | | | 435, 400 | 19, 876 |
| Whitefish: | | | | | | |
| Common | 363, 600 | 74, 447 | 69, 100 | 8, 588 | 3, 228, 200 | 668, 027 |
| Menominee | 18, 200 | 1, 718 | | | 137, 600 | 12, 566 |
| Yellow perch | 9, 000 | 902 | 221, 500 | 13, 483 | 5, 066, 600 | 432, 586 |
| Yellow pike | 3, 500 | 491 | 685, 500 | 55, 779 | 5, 457, 600 | 550, 215 |
| Crawfish | | | | | 6, 400 | 642 |
| Mussel shells [1] | | | | | 846, 500 | 25, 433 |
| Pearls and slugs [1] | | | | | | 524 |
| Total | 16, 011, 300 | 918, 859 | 2, 103, 000 | 112, 304 | 83, 958, 400 | 6, 033, 084 |

[1] From tributary streams.

## *Industries related to the fisheries of the Lake States, 1937*

### OPERATING UNITS, SALARIES, AND WAGES

| Item | New York | Pennsylvania | Ohio | Indiana | Illinois | Michigan | Wisconsin | Minnesota | Total |
|---|---|---|---|---|---|---|---|---|---|
| Transporting: | | | | | | | | | |
| Persons engaged: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | 17 | | | 6 | | | 23 |
| On boats | | | | | | 12 | | | 12 |
| Total | | | 17 | | | 18 | | | 35 |
| Vessels, motor | | | 11 | | | 3 | | | 14 |
| Net tonnage | | | 143 | | | 21 | | | 164 |
| Boats | | | | | | 4 | | | 4 |
| Wholesale and manufacturing: | | | | | | | | | |
| Establishments | 20 | 7 | 52 | 3 | 45 | 49 | 41 | 13 | 230 |
| Persons engaged: | | | | | | | | | |
| Proprietors | 23 | 6 | 46 | 3 | 17 | 37 | 30 | 5 | 167 |
| Salaried employees | 32 | 7 | 77 | 2 | 166 | 71 | 59 | 31 | 445 |
| Wage earners: | | | | | | | | | |
| Average for season | 132 | 63 | 281 | 5 | 602 | 465 | 581 | 137 | 2, 266 |
| Average for year | 95 | 43 | 213 | 5 | 481 | 171 | 211 | 58 | 1, 277 |
| Paid to salaried employees | $42, 993 | $13, 127 | $181, 249 | $1, 920 | $429, 420 | $141, 712 | $99, 075 | $40, 118 | $949. 614 |
| Paid to wage earners | $106, 246 | $48, 650 | $303, 174 | $6, 200 | $668, 639 | $211, 306 | $223, 853 | $77, 232 | $1,645,300 |
| Total salaries and wages | $149, 239 | $61, 777 | $484. 423 | $8, 120 | $1,098,059 | $353, 018 | $322, 928 | $117, 350 | $2,594,914 |
| Fishermen manufacturing | | | 13 | | 28 | 28 | 36 | 118 | 223 |

*Industries related to the fisheries of the Lake States, 1937*—Continued

PRODUCTS MANUFACTURED

| Item | New York | | Pennsylvania | | Ohio | | Indiana | |
|---|---|---|---|---|---|---|---|---|
| By manufacturing establishments: | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Alewives, spiced......pounds.. | -------- | -------- | -------- | -------- | (1) | (1) | -------- | -------- |
| Blue pike: | | | | | | | | |
| Fresh fillets..........do.... | 594,656 | $136,127 | 189,033 | $32,336 | 1,211,392 | $278,356 | -------- | -------- |
| Frozen fillets..........do.... | 72,200 | 17,510 | 80,910 | 13,096 | 300,606 | 74,777 | -------- | -------- |
| Chubs, cisco, and tullibees, smoked ............pounds.. | (1) | (1) | -------- | -------- | (1) | (1) | 72,000 | $18,100 |
| Eels, smoked.............do.... | (1) | (1) | -------- | -------- | -------- | -------- | -------- | -------- |
| Herring, lake, smoked..do.... | -------- | -------- | -------- | -------- | (1) | (1) | -------- | -------- |
| Herring, sea, spiced......do.... | (1) | (1) | -------- | -------- | -------- | -------- | -------- | -------- |
| Lake trout, smoked......do.... | -------- | -------- | -------- | -------- | -------- | -------- | (1) | (1) |
| Pickerel, fresh fillets....do.... | -------- | -------- | -------- | -------- | 10,780 | 2,832 | -------- | -------- |
| Sablefish, smoked.........do.... | -------- | -------- | -------- | -------- | (1) | (1) | -------- | -------- |
| Salmon, smoked.........do.... | -------- | -------- | -------- | -------- | (1) | (1) | -------- | -------- |
| Sauger pike: | | | | | | | | |
| Fresh fillets..........do.... | 71,690 | 16,025 | -------- | -------- | 211,111 | 47,725 | -------- | -------- |
| Frozen fillets..........do.... | 61,125 | 13,835 | (1) | (1) | 119,804 | 32,722 | -------- | -------- |
| Sheepshead, smoked.....do.... | -------- | -------- | -------- | -------- | 16,000 | 1,960 | -------- | -------- |
| Sturgeon, smoked.........do.... | (1) | (1) | -------- | -------- | -------- | -------- | -------- | -------- |
| White bass, fresh fillets..do.... | (1) | (1) | (1) | (1) | 2,016 | 463 | -------- | -------- |
| Yellow perch: | | | | | | | | |
| Fresh fillets..........do.... | 35,843 | 7,781 | 8,140 | 1,295 | 254,254 | 61,753 | -------- | -------- |
| Frozen fillets..........do.... | -------- | -------- | (1) | (1) | 23,285 | 6,190 | -------- | -------- |
| Yellow pike: | | | | | | | | |
| Fresh fillets..........do.... | 29,419 | 7,503 | (1) | (1) | 35,673 | 9,616 | -------- | -------- |
| Frozen fillets..........do.... | 2,890 | 648 | (1) | (1) | (1) | (1) | -------- | -------- |
| Whitefish: | | | | | | | | |
| Fresh fillets..........do.... | 11,160 | 3,890 | 1,725 | 359 | (1) | (1) | -------- | -------- |
| Smoked..............do.... | 17,400 | 5,764 | -------- | -------- | (1) | (1) | (1) | (1) |
| Unclassified products: | | | | | | | | |
| Fillets, fresh and frozen pounds.. | (2) | (2) | [3] 14,155 | [3] 2,704 | [4] 26,326 | [4] 8,989 | -------- | -------- |
| Smoked..............do.... | [5] 192,400 | [5] 42,637 | -------- | -------- | [6] 84,820 | [6] 22,453 | (2) | (2) |
| Spiced..............do.... | (2) | (2) | -------- | -------- | (2) | (2) | -------- | -------- |
| Miscellaneous.........do.... | [10] 330,341 | [10] 24,735 | -------- | -------- | [11] 167,640 | [11] 16,977 | [12] 26,000 | [12] 6,700 |
| Total..............do.... | 1,419,124 | 276,455 | 293,963 | 49,790 | 2,463,707 | 564,813 | 98,000 | 24,800 |
| By fishermen: | | | | | | | | |
| Blue pike, fresh fillets...do.... | -------- | -------- | -------- | -------- | 600 | 138 | -------- | -------- |
| Carp, smoked............do.... | -------- | -------- | -------- | -------- | 1,900 | 310 | -------- | -------- |
| Catfish and bullheads, smoked pounds.. | -------- | -------- | -------- | -------- | 1,150 | 230 | -------- | -------- |
| Herring, lake, smoked..do.... | -------- | -------- | -------- | -------- | 1,500 | 300 | -------- | -------- |
| Lake trout, smoked......do.... | -------- | -------- | -------- | -------- | 2,900 | 1,015 | -------- | -------- |
| Mooneye, smoked.........do.... | -------- | -------- | -------- | -------- | 2,950 | 471 | -------- | -------- |
| Sauger pike, fresh fillets.do.... | -------- | -------- | -------- | -------- | 2,700 | 620 | -------- | -------- |
| Sheepshead, smoked.....do.... | -------- | -------- | -------- | -------- | 6,200 | 793 | -------- | -------- |
| Yellow pike: | | | | | | | | |
| Fresh fillets..........do.... | -------- | -------- | -------- | -------- | 1,000 | 230 | -------- | -------- |
| Smoked..............do.... | -------- | -------- | -------- | -------- | 1,900 | 475 | -------- | -------- |
| Whitefish, smoked.......do.... | -------- | -------- | -------- | -------- | 1,100 | 330 | -------- | -------- |
| White bass, smoked......do.... | -------- | -------- | -------- | -------- | 1,400 | 181 | -------- | -------- |
| Total.................do.... | -------- | -------- | -------- | -------- | 25,300 | 5,093 | -------- | -------- |
| Grand total............do.... | 1,419,124 | 276,455 | 293,963 | 49,790 | 2,489,007 | 569,906 | 98,000 | 24,800 |

See footnotes at end of table.

## *Industries related to the fisheries of the Lake States, 1937*—Continued

### PRODUCTS MANUFACTURED—Continued

| Item | Illinois | | Michigan | | Wisconsin | | Minnesota | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments: | | | | | | | | |
| Alewives, spiced ... pounds | 1,080,000 | $88,500 | -------- | -------- | (1) | (1) | -------- | -------- |
| Blue pike: | | | | | | | | |
| Fresh fillets ... do | 525,448 | 112,272 | (1) | (1) | 56,500 | $13,275 | -------- | -------- |
| Frozen fillets ... do | 47,640 | 9,724 | -------- | -------- | -------- | -------- | -------- | -------- |
| Chubs, cisco, and tullibees, smoked ... pounds | 1,820,409 | 383,976 | 430,200 | $116,800 | 607,152 | 133,088 | 24,500 | $5,540 |
| Eels, smoked ... do | 16,749 | 4,463 | -------- | -------- | -------- | -------- | -------- | -------- |
| Herring, lake: | | | | | | | | |
| Fresh fillets ... do | (1) | (1) | (1) | (1) | 106,000 | 7,700 | -------- | -------- |
| Salted ... do | -------- | -------- | 1,255,255 | 48,557 | 2,199,075 | 93,015 | 764,000 | 31,875 |
| Smoked ... do | (1) | (1) | 319,000 | 34,980 | 586,000 | 46,130 | 31,500 | 2,940 |
| Herring, sea, spiced ... do | (1) | (1) | -------- | -------- | 116,109 | 17,018 | -------- | -------- |
| Lake trout, smoked ... do | 63,132 | 13,650 | 171,750 | 53,250 | 143,152 | 36,550 | (1) | (1) |
| Pickerel, fresh fillets ... do | (1) | (1) | -------- | -------- | -------- | -------- | -------- | -------- |
| Sablefish, smoked ... do | 13,587 | 3,959 | (1) | (1) | 33,000 | 4,950 | -------- | -------- |
| Salmon, smoked ... do | 659,432 | 250,370 | 277,800 | 69,716 | 155,000 | 30,470 | (1) | (1) |
| Sauger pike: | | | | | | | | |
| Fresh fillets ... do | 958,465 | 210,759 | -------- | -------- | -------- | -------- | -------- | -------- |
| Frozen fillets ... do | 309,991 | 67,297 | (1) | (1) | -------- | -------- | -------- | -------- |
| Sturgeon, smoked ... do | 14,126 | 11,945 | -------- | -------- | -------- | -------- | -------- | -------- |
| Yellow perch: | | | | | | | | |
| Fresh fillets ... do | 121,019 | 27,674 | (1) | (1) | 173,700 | 40,049 | -------- | -------- |
| Frozen fillets ... do | 18,747 | 4,348 | -------- | -------- | -------- | -------- | -------- | -------- |
| Yellow pike: | | | | | | | | |
| Fresh fillets ... do | 162,634 | 37,376 | -------- | -------- | 105,000 | 22,935 | -------- | -------- |
| Frozen fillets ... do | 19,139 | 4,013 | -------- | -------- | -------- | -------- | -------- | -------- |
| Whitefish: | | | | | | | | |
| Fresh fillets ... do | 26,381 | 6,900 | -------- | -------- | -------- | -------- | -------- | -------- |
| Smoked ... do | (1) | (1) | 48,850 | 12,396 | (1) | (1) | (1) | (1) |
| Unclassified products: | | | | | | | | |
| Fillets, fresh and frozen ... pounds | (2) | (2) | (2) | (2) | (2) | (2) | -------- | -------- |
| Smoked ... do | [7] 98,205 | [7] 15,012 | (2) | (2) | [8] 90,000 | [8] 9,900 | (2) | (2) |
| Spiced ... do | [9] 571,272 | [9] 66,141 | -------- | -------- | (2) | (2) | -------- | -------- |
| Miscellaneous ... do | -------- | [13] 10,823 | [14] 221,905 | [14] 46,100 | -------- | [15] 62,392 | -------- | [16] 11,775 |
| Total ... do | -------- | 1,329,202 | 2,724,760 | 381,799 | -------- | 517,472 | -------- | 52,130 |
| By fishermen: | | | | | | | | |
| Chubs, smoked ... do | 10,000 | 2,500 | 13,000 | 3,900 | 35,000 | 8,750 | -------- | -------- |
| Herring, lake: | | | | | | | | |
| Salted ... do | -------- | -------- | -------- | -------- | 157,000 | 6,100 | 198,440 | 7,893 |
| Smoked ... do | -------- | -------- | 175,000 | 8,750 | -------- | -------- | -------- | -------- |
| Lake trout, smoked ... do | 10,000 | 3,000 | 12,500 | 3,750 | 3,000 | 900 | -------- | -------- |
| Whitefish, smoked ... do | -------- | -------- | 2,500 | 850 | -------- | -------- | -------- | -------- |
| Whitefish, caviar, salted ... pounds | -------- | -------- | -------- | -------- | -------- | -------- | 60 | 60 |
| Total ... do | 20,000 | 5,500 | 203,000 | 17,250 | 195,000 | 15,750 | 198,500 | 7,953 |
| Grand total ... do | -------- | 1,334,702 | 2,927,760 | 399,049 | -------- | 533,222 | -------- | 60,083 |

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[1] The production of this item has been included under "Unclassified products."

[2] The production of this item has been included under "Miscellaneous."

[3] Includes fresh fillets of white bass and yellow pike; and frozen fillets of sauger pike, white bass, yellow perch, yellow pike, and whitefish.

[4] Includes fresh fillets of lake trout, whitefish, flounders, mullet and sheepshead, and frozen yellow pike fillets.

[5] Includes smoked chubs, cisco, tullibees, eels, goldeyes, sea herring, and sturgeon, and kippered salmon.

[6] Includes smoked catfish and bullheads, chubs, ciscoes, tullibees, lake herring, mooneye, sablefish, salon, yellow pike, and whitefish.

[7] Includes smoked buffalofish, carp, lake herring, sea herring, whitefish, and whiting, and kippered salmon.

[8] Includes smoked carp and whitefish.

[9] Includes spiced anchovies, sea herring, mackerel, and oyster and shrimp cocktail.

[10] Includes fresh fillets of lake trout and white bass; frozen fillets of lake trout; and spiced sea herring.

[11] Includes smoked carp and spiced alewives.

[12] Includes smoked lake trout and whitefish.

[13] Includes fresh fillets of carp, halibut, lake herring, lake trout, pickerel, salmon, red snapper, and suckers, and canned soft clam chowder.

[14] Includes fresh fillets of blue pike, lake herring, and yellow perch; frozen fillets of sauger pike; and smoked butterfish, carp, mackerel, and sablefish.

[15] Includes fresh lake trout fillets; spiced chub and alewives; burbot-liver oil; poultry feed and lime from fresh-water mussel shells, and canned whitefish caviar.

[16] Includes smoked lake trout, salmon and whitefish; and burbot-liver oil.

NOTE.—The total value of the manufactured products for the Lake States was as follows: By manufacturing establishments, $3,196,461; and by fishermen, $51,546. Some of the above products may have been manufactured from products imported from another State or a foreign country; therefore, they cannot be correlated directly with the catch within the State. All of the persons engaged in the preparation of fishermen's manufactured products have also been included as fishermen and 12 of the persons shown on transporting craft have also been included as fishermen. This should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## FISHERIES OF THE MISSISSIPPI RIVER AND TRIBUTARIES [12]

The most recent complete catch statistics of the fisheries for the States of the Mississippi River and tributaries are those collected for the year 1931. The yield of fishery products in that year amounted to 82,382,523 pounds, valued at $2,897,357, which was a decrease of 22 percent in quantity and 36 percent in value as compared with the quantity and value of the catch in 1922, the year for which the most recent preceding survey was made. Detailed statistics of the fisheries of the Mississippi River and tributaries for 1931 appear in "Fishery Industries of the United States, 1932" by R. H. Fiedler, Appendix III to the Report of the Commissioner of Fisheries for the fiscal year 1933. A summary of these fisheries in 1931, as well as certain data for 1937, appear in the following tables:

*Fisheries of the Mississippi River and Tributaries, 1931*

OPERATING UNITS: BY STATES

| Item | Alabama | Arkansas | Illinois | Indiana | Iowa | Kansas | Kentucky | Louisiana | Minnesota |
|---|---|---|---|---|---|---|---|---|---|
| Fishermen: | | | | | | | | | |
| On boats and shore: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Regular | 104 | 1, 463 | 708 | 20 | 245 | 35 | 89 | 1, 402 | 160 |
| Casual | 131 | 1, 524 | 1, 318 | 1, 735 | 648 | 88 | 440 | 3, 108 | 578 |
| Total | 235 | 2, 987 | 2, 026 | 1, 755 | 893 | 123 | 529 | 4, 510 | 738 |
| Boats: | | | | | | | | | |
| Motor | 32 | 907 | 676 | 544 | 309 | 18 | 92 | 1, 225 | 65 |
| Other | 190 | 2, 359 | 957 | 1, 189 | 457 | 123 | 420 | 2, 369 | 446 |
| Apparatus: | | | | | | | | | |
| Haul seines | | 16 | 127 | 50 | 133 | | 24 | 377 | 113 |
| Length, yards | | 7, 308 | 33, 975 | 5, 170 | 36, 339 | | 2, 057 | 85, 166 | 49, 968 |
| Anchor gill nets | | 4 | | | | | | 74 | 9 |
| Square yards | | 2, 800 | | | | | | 17, 400 | 9, 999 |
| Trammel nets | | 31 | 28 | 3 | | 90 | | 78 | |
| Square yards | | 3, 899 | 4, 890 | 360 | | 9, 026 | | 19, 696 | |
| Lines, trot | 449 | 5, 327 | 1, 312 | 320 | 1, 158 | 17 | 627 | 5, 757 | 186 |
| Hooks | 35, 980 | 455, 000 | 124, 715 | 16, 767 | 186, 250 | 360 | 37, 395 | 1, 392, 200 | 41, 800 |
| Pound nets | | | | | 2 | | | | 27 |
| Fyke nets | 610 | 5, 346 | 9, 852 | 335 | 1, 981 | 189 | 1, 231 | 5, 908 | 74 |
| Dip nets | | | 22 | | 10 | | | 159 | |
| Traps: | | | | | | | | | |
| Crawfish | | | | | | | | 18 | |
| Shrimp | | | | | | | | 88 | |
| Baskets | | | 3, 769 | | | | | | |
| Mussel dredges | | 426 | 14 | | | | | | |
| Yards at mouth | | 286 | 10 | | | | | | |
| Crowfoot bars | 168 | 1, 038 | 840 | 1, 092 | 464 | | 256 | 10 | 192 |
| Tongs | | 159 | | 72 | | | | 5 | |
| Rakes | | 70 | | | | | | | |
| Forks | | 102 | 33 | 1, 278 | | 29 | | 5 | |
| Grabs | | | | | | | | 2, 232 | |

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[12] For a clearer understanding of the statistics published in this section, the reader is referred to the section in the later part of the document entitled "Statistical survey procedure."

## *Fisheries of the Mississippi River and Tributaries, 1931*—Continued

### OPERATING UNITS: BY STATES—Continued

| Items | Mississippi | Missouri | Nebraska | Ohio | Oklahoma | South Dakota | Tennessee | Texas | Wisconsin | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On boats and shore: | | | | | | | | | | |
| Regular | 211 | 177 | | | 5 | | 327 | 5 | 202 | 5,153 |
| Casual | 198 | 170 | 299 | 49 | 19 | 67 | 206 | 41 | 112 | 10,731 |
| Total | 409 | 347 | 299 | 49 | 24 | 67 | 533 | 46 | 314 | 15,884 |
| Boats: | | | | | | | | | | |
| Motor | 138 | 84 | 30 | | | 2 | 138 | 6 | 160 | 4,426 |
| Other | 329 | 304 | 187 | 49 | 18 | 34 | 467 | 42 | 180 | 10,120 |
| Apparatus: | | | | | | | | | | |
| Haul seines | 16 | 47 | 12 | 2 | 2 | 11 | | | 83 | 1,013 |
| Length, yards | 6,885 | 5,668 | 906 | 180 | 60 | 1,948 | | | 20,149 | 255,779 |
| Anchor gill nets | 4 | 1 | | | 3 | | | | 6 | 101 |
| Square yards | 800 | 160 | | | 990 | | | | 13,488 | 45,637 |
| Trammel nets | 17 | 104 | 115 | | | | 52 | | | 518 |
| Square yards | 2,867 | 14,668 | 4,833 | | | | 3,560 | | | 63,799 |
| Lines: | | | | | | | | | | |
| Hand | | | | | | | 67 | | | 67 |
| Hooks | | | | | | | 67 | | | 67 |
| Trot | 847 | 516 | | 19 | 29 | 18 | 464 | 80 | 3 | 17,129 |
| Hooks | 72,155 | 34,600 | | 900 | 1,075 | 3,600 | 41,690 | 14,500 | 125 | 2,459,112 |
| Pounds nets | | | | | | | | | 345 | 374 |
| Fyke nets | 2,591 | 1,872 | 296 | 76 | 85 | 68 | 1,735 | 70 | 222 | 32,541 |
| Dip nets | | | | | | | | | | 191 |
| Traps: | | | | | | | | | | |
| Crawfish | | | | | | | | | | 18 |
| Shrimp | 350 | | | | | | | | | 438 |
| Baskets | | | | | | | | | | 3,769 |
| Spears | | | | | | | 12 | | | 12 |
| Mussel dredges | | | | | | | | | | 440 |
| Yards at mouth | | | | | | | | | | 296 |
| Crowfoot bars | | | | | | | 230 | | 190 | 4,480 |
| Tongs | | 9 | | | | | | | | 245 |
| Rakes | | | | | | | | | | 70 |
| Forks | | | | | | | | | | 1,447 |
| Grabs | | | | | | | | | | 2,232 |

### CATCH: BY STATES

| Species | Alabama | | Arkansas | | Illinois | | Indiana | |
|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | | | 700 | $38 | 8,308 | $241 | | |
| Buffalofish | 21,330 | $2,342 | 2,182,446 | 131,471 | 911,609 | 51,893 | 85,045 | $8,156 |
| Carp | 11,000 | 1,118 | 808,206 | 27,268 | 4,878,744 | 128,221 | 157,641 | 10,162 |
| Catfish and bullheads | 81,200 | 8,850 | 1,077,343 | 93,150 | 647,696 | 68,890 | 35,370 | 5,302 |
| Crappie | 9,772 | 1,001 | 11,325 | 227 | | | | |
| Eels | | | | | 4,985 | 322 | | |
| Mooneye | | | | | 1,000 | 20 | | |
| Paddlefish or spoonbill cat | 3,958 | 338 | 93,200 | 2,159 | 104,846 | 5,480 | 16,492 | 1,724 |
| Quillback or "American carp" | 7,657 | 875 | 6,830 | 676 | 17,532 | 608 | 30,312 | 1,436 |
| Sheepshead | 45,909 | 4,972 | 676,358 | 29,877 | 177,709 | 11,321 | 38,740 | 3,711 |
| Sturgeon, shovelnose | 575 | 70 | | | 39,766 | 3,448 | 3,013 | 292 |
| Sucker "mullet" | 5,752 | 609 | 3,309 | 235 | 25,130 | 1,087 | 16,797 | 1,156 |
| White bass | | | | | 1,200 | 92 | | |
| Yellow pike | | | | | | | 4,550 | 693 |
| Total | 187,153 | 20,178 | 4,859,717 | 285,094 | 6,818,525 | 271,623 | 387,960 | 32,632 |
| SHELLFISH, ETC. | | | | | | | | |
| Mussel shells | 1,635,000 | 10,132 | 10,872,790 | 108,819 | 7,429,528 | 82,894 | 7,328,736 | 105,632 |
| Pearls | | | | 3,137 | | 190 | | 125 |
| Slugs | | 2,444 | | 14,401 | | 11,835 | | 18,788 |
| Turtles: | | | | | | | | |
| Snappers | | | | | 14,577 | 696 | 500 | 25 |
| Soft-shell | | | | | | | 400 | 20 |
| Total | 1,635,000 | 12,576 | 10,872,790 | 126,357 | 7,444,105 | 95,615 | 7,329,636 | 124,590 |
| Grand total | 1,822,153 | 32,754 | 15,732,507 | 411,451 | 14,262,630 | 367,238 | 7,717,596 | 157,222 |

*Fisheries of the Mississippi River and Tributaries, 1931*—Continued

CATCH: BY STATES—Continued

| Species | Iowa |  | Kansas |  | Kentucky |  | Louisiana[1] |  |
|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | 91, 825 | $3, 759 |  |  |  |  | 5, 715 | $114 |
| Buffalofish | 746, 615 | 59, 705 | 24, 325 | $2, 222 | 164, 558 | $14, 429 | 8, 784, 314 | 263, 261 |
| Carp | 1, 594, 244 | 80, 134 | 117, 489 | 10, 956 | 113, 461 | 8, 124 | 204, 743 | 4, 127 |
| Catfish and bullheads | 467, 340 | 48, 593 | 770 | 111 | 131, 777 | 17, 043 | 6, 602, 987 | 528, 579 |
| Eels | 325 | 15 |  |  |  |  | 200 | 6 |
| Garfish |  |  |  |  |  |  | 72, 450 | 791 |
| Mooneye | 1, 100 | 28 |  |  | 990 | 105 |  |  |
| Paddlefish or spoonbill cat | 9, 400 | 638 |  |  | 18, 322 | 1, 617 | 495, 544 | 21. 508 |
| Pike or pickerel | 4, 700 | 470 |  |  |  |  |  |  |
| Quillback or "American carp" | 60, 450 | 1, 339 | 100 | 11 | 11, 355 | 984 | 20, 700 | 431 |
| Sauger |  |  |  |  | 2, 365 | 451 |  |  |
| Sheepshead | 343, 449 | 17, 619 |  |  | 52, 560 | 6, 762 | 1, 976, 600 | 39, 577 |
| Sturgeon, shovelnose | 17, 650 | 1, 663 | 175 | 24 | 2. 967 | 380 |  |  |
| Sucker "mullet" | 36, 550 | 822 |  |  | 10, 294 | 1, 331 |  |  |
| Yellow pike |  |  |  |  | 70 | 18 |  |  |
| Total | 3, 373. 648 | 214, 785 | 142, 859 | 13, 324 | 508, 719 | 51, 244 | 18, 163, 253 | 858, 394 |
| SHELLFISH, ETC. |  |  |  |  |  |  |  |  |
| Crawfish |  |  |  |  |  |  | 29, 248 | 292 |
| Shrimp |  |  |  |  |  |  | 38, 503 | 2, 423 |
| Mussel shells | 4, 366, 219 | 65, 685 | 312, 562 | 2, 713 | 1, 113, 032 | 8, 786 | 50, 000 | 375 |
| Pearls |  | 7, 244 |  |  |  |  |  |  |
| Slugs |  | 13, 924 |  | 636 |  | 852 |  |  |
| Frogs |  |  |  |  |  |  | 872, 651 | 130, 612 |
| Terrapin | 19, 100 | 377 |  |  |  |  |  |  |
| Turtles: |  |  |  |  |  |  |  |  |
| Snapper | 2, 000 | 40 |  |  |  |  | 58, 013 | 2, 244 |
| Soft-shell | 17, 000 | 340 |  |  |  |  | 1, 700 | 34 |
| Total | 4, 404, 319 | 87, 610 | 312, 562 | 3, 349 | 1, 113, 032 | 9, 638 | 1, 050, 115 | 135, 980 |
| Grand total | 7, 777, 967 | 302, 395 | 455, 421 | 16. 673 | 1, 621, 751 | 60, 882 | 19, 213, 368 | 994. 374 |

| Species | Minnesota |  | Mississippi |  | Missouri |  | Nebraska |  |
|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | 16, 598 | $282 |  |  | 17, 000 | $520 |  |  |
| Buffalofish | 257, 431 | 15, 092 | 1, 511, 126 | $63, 824 | 178, 991 | 16, 414 | 18, 104 | $1, 813 |
| Carp | 2, 151, 119 | 97, 756 | 225, 276 | 6. 730 | 433, 117 | 33, 356 | 93, 032 | 9, 305 |
| Catfish and bullheads | 53, 804 | 4, 841 | 635, 049 | 42, 384 | 91, 430 | 15, 487 | 34, 174 | 5, 135 |
| Eels |  |  | 250 | 20 | 1, 055 | 53 |  |  |
| Minnows |  |  |  |  | 525 | 209 |  |  |
| Paddlefish or spoonbill cat |  |  | 158, 821 | 5, 879 | 40, 103 | 2, 917 |  |  |
| Quillback or "American carp" | 17, 246 | 519 | 2, 157 | 42 | 13, 672 | 946 |  |  |
| Sheepshead | 152, 545 | 7, 938 | 106, 844 | 2, 576 | 38, 186 | 3, 773 |  |  |
| Sturgeon, shovelnose | 1, 634 | 115 | 100 | 3 | 17, 282 | 1, 703 |  |  |
| Sucker "mullet" | 65, 273 | 1, 955 |  |  | 2, 275 | 292 |  |  |
| Total | 2, 715, 650 | 128, 498 | 2, 639, 623 | 121, 458 | 833, 636 | 75, 670 | 145, 310 | 16, 253 |
| SHELLFISH, ETC. |  |  |  |  |  |  |  |  |
| Shrimp |  |  | 10, 000 | 1, 500 |  |  |  |  |
| Mussel shells | 782, 630 | 7, 827 |  |  | 94, 000 | 1, 193 |  |  |
| Pearls |  | 157 |  |  |  |  |  |  |
| Slugs |  | 1, 174 |  |  |  | 118 |  |  |
| Turtles, snapper |  |  | 100 | 3 |  |  |  |  |
| Total | 782, 630 | 9, 158 | 10, 100 | 1, 503 | 94, 000 | 1, 311 |  |  |
| Grand total | 3, 498, 280 | 137, 656 | 2, 649, 723 | 122, 961 | 927, 636 | 76, 981 | 145, 310 | 16, 253 |

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[1] According to statistics published by the Louisiana Department of Conservation , the catch of commercial fresh-water fish in Louisiana during 1937 was as follows: Catfish, 3,867,165 pounds, valued at $348,045; gaspergou, 1,562,037 pounds, valued at $78,102; spoonbill cat, 565,026 pounds, valued at $39,552; buffalofish, 5 684 613 pounds, valued at $284,231; terrapins 21,600 in number, valued at $21,600; fresh-water turtles, 61,819 pounds, valued at $9,273; frogs, 2,295,460 pounds, valued at $573,640; fresh-water shrimp, 2,036,575 pounds, valued at $162,926; crayfish, 2,500,000 pounds, valued at $175,000; and "baby" green turtles, 4,700,000 in number, valued at $47,000.

## *Fisheries of the Mississippi River and Tributaries, 1931*—Continued

### CATCH: BY STATES—Continued

| Species | Ohio | | Oklahoma | | South Dakota | | Tennessee[1] | |
|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Black bass | | | | | | | 14, 000 | $1, 680 |
| Buffalofish | 6, 433 | $662 | 21, 605 | $2, 142 | 38, 926 | $3, 894 | 478, 592 | 34, 247 |
| Carp | 14, 370 | 1, 543 | 4, 268 | 425 | 52, 836 | 2, 642 | 247, 841 | 9, 594 |
| Catfish and bullheads | 4, 380 | 811 | 4, 935 | 695 | 13, 500 | 3, 528 | 271, 753 | 24, 750 |
| Crappie | | | | | 1, 392 | 70 | 18, 652 | 1, 658 |
| Eels | | | | | | | 163 | 25 |
| Paddlefish or spoonbill cat | | | 5, 332 | 533 | 400 | 40 | 5, 034 | 301 |
| Quillback or "American carp" | 1, 195 | 119 | 1, 950 | 195 | 4, 364 | 220 | 6, 065 | 843 |
| Sheepshead | 1, 318 | 224 | 1, 550 | 155 | 697 | 70 | 197, 670 | 10, 465 |
| Sturgeon, shovelnose | 558 | 72 | | | | | 3, 706 | 393 |
| Sucker "mullet" | 2, 902 | 268 | | | 2, 246 | 112 | 8, 323 | 1, 119 |
| Sunfish | | | | | | | 21, 850 | 1, 094 |
| White bass | | | | | | | 2, 100 | 106 |
| Yellow pike | 325 | 60 | | | | | | |
| Total | 31, 481 | 3, 759 | 39, 640 | 4, 145 | 114, 361 | 10, 576 | 1, 275, 749 | 86, 275 |
| SHELLFISH, ETC. | | | | | | | | |
| Mussel shells | 154, 000 | 3, 005 | | | | | 2, 157, 000 | 15, 604 |
| Pearls | | | | | | | | 28 |
| Slugs | | 308 | | | | | | 1, 724 |
| Frogs | | | | | | | 2, 250 | 270 |
| Terrapin | | | | | | | 70 | 14 |
| Total | 154, 000 | 3, 313 | | | | | 2, 159, 320 | 17, 640 |
| Grand total | 185, 481 | 7, 072 | 39, 640 | 4, 145 | 114, 361 | 10, 576 | 3, 435, 069 | 103, 915 |

| Species | Texas | | Wisconsin | | Total | |
|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Black bass | | | | | 14, 000 | $1, 680 |
| Bowfin | | | 288, 170 | $4, 355 | 428, 316 | 9, 299 |
| Buffalofish | 73, 000 | $2, 190 | 268, 001 | 13, 528 | 15, 772, 451 | 687, 288 |
| Carp | 6, 900 | 138 | 777, 474 | 23, 800 | 11, 891, 761 | 455, 399 |
| Catfish and bullheads | 47, 800 | 3, 824 | 65, 539 | 5, 825 | 10, 266, 847 | 877, 798 |
| Crappie | | | | | 41, 141 | 2, 959 |
| Eels | | | | | 6, 978 | 441 |
| Garfish | | | | | 72, 450 | 791 |
| Minnows | | | | | 525 | 209 |
| Mooneye | | | | | 3, 090 | 153 |
| Paddlefish or spoonbill cat | | | | | 951, 452 | 43, 134 |
| Pike or pickerel | | | | | 4, 700 | 470 |
| Quillback or "American carp" | 500 | 10 | 66, 353 | 2, 032 | 268, 438 | 11, 286 |
| Sauger | | | | | 2, 365 | 451 |
| Sheepshead | 10, 300 | 206 | 84, 409 | 3, 692 | 3, 904, 844 | 142, 938 |
| Sturgeon, shovelnose | | | | | 87, 426 | 8, 163 |
| Sucker "mullet" | | | 135, 984 | 3, 696 | 314, 835 | 12, 682 |
| Sunfish | | | | | 21, 850 | 1, 094 |
| White bass | | | | | 3, 300 | 198 |
| Yellow pike | | | | | 4, 945 | 771 |
| Total | 138, 500 | 6, 368 | 1, 685, 930 | 56, 928 | 44, 061, 714 | 2, 257, 204 |
| SHELLFISH, ETC. | | | | | | |
| Crawfish | | | | | 29, 248 | 292 |
| Shrimp | | | | | 48, 503 | 3, 923 |
| Mussel shells | | | 959, 200 | 8, 946 | 37, 254, 697 | 421, 611 |
| Pearls | | | | 555 | | 11, 436 |
| Slugs | | | | 2, 012 | | 68, 216 |
| Frogs | | | | | 874, 901 | 130, 882 |
| Terrapin | | | | | 19, 170 | 391 |
| Turtles: | | | | | | |
| Snapper | | | | | 75, 190 | 3, 008 |
| Soft-shell | | | | | 19, 100 | 394 |
| Total | | | 959, 200 | 11, 513 | 38, 320, 809 | 640, 153 |
| Grand total | 138, 500 | 6, 368 | 2, 645, 130 | 68, 441 | 82, 382, 523 | 2, 897, 357 |

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[1] According to statistics furnished the Bureau by the office of fish technician, division of game and fish, Tennessee Department of Conservation, the catch of commercial fresh-water fish in Reelfoot Lake in Tennessee during 1937 was as follows: Bass, 5,250 pounds; buffalofish, 206,310 pounds; bullheads, 25,338 pounds; carp, 31,798 pounds; catfish, 83,184 pounds; crappie, 59,296 pounds; drum, 34,648 pounds; eels, 274 pounds; pike, 24 pounds; sunfish, 53,878 pounds; spoonbill cat, 10,239 pounds; white bass, 92 pounds; and yellow bass, 18,762 pounds.

*Industries related to the fisheries of the Mississippi River and Tributaries*

OPERATING UNITS, SALARIES, AND WAGES, 1931

| Item | Arkansas | Illinois | Indiana | Iowa | Kentucky | Louisiana | Minnesota and North Dakota |
|---|---|---|---|---|---|---|---|
| Transporting: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Persons engaged | 13 | | | | 11 | 5 | |
| Vessels, motor | 4 | | | | 2 | 2 | |
| Net tonnage | 69 | | | | 15 | 20 | |
| Wholesale and manufacturing: | | | | | | | |
| Establishments | 6 | 38 | 4 | 61 | 11 | 22 | 13 |
| Persons engaged: | | | | | | | |
| Proprietors | 3 | 42 | 1 | 52 | 8 | 24 | 11 |
| Salaried employees | 9 | 3 | 5 | 79 | 20 | 14 | 27 |
| Wage earners: | | | | | | | |
| Average for season | 152 | 331 | 140 | 2,500 | 261 | 70 | 112 |
| Average for year | 72 | 235 | 93 | 2,179 | 159 | 68 | 112 |
| Paid to salaried employees | $11,417 | $9,520 | $6,820 | $141,346 | $33,159 | $12,400 | $55,200 |
| Paid to wage earners | $53,503 | $145,683 | $51,444 | $1,417,678 | $81,643 | $37,700 | $81,500 |
| Total salaries and wages | $64,920 | $155,203 | $58,264 | $1,559,024 | $114,802 | $50,100 | $136,700 |
| Fishermen manufacturing | | 4 | 2 | | | 200 | |

| Item | Mississippi | Missouri and Oklahoma | Nebraska and Kansas | Ohio and Pennsylvania | Tennessee | Wisconsin | Total |
|---|---|---|---|---|---|---|---|
| Transporting: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Persons engaged | | | | | | | 29 |
| Vessels, motor | | | | | | | 8 |
| Net tonnage | | | | | | | 104 |
| Wholesale and manufacturing: | | | | | | | |
| Establishments | 6 | 21 | 3 | 13 | 11 | 8 | 217 |
| Persons engaged: | | | | | | | |
| Proprietors | 7 | 24 | 3 | 17 | 9 | 3 | 204 |
| Salaried employees | 3 | 125 | 8 | 37 | 15 | 10 | 355 |
| Wage earners: | | | | | | | |
| Average for season | 26 | 328 | 52 | 175 | 90 | 38 | 4,275 |
| Average for year | 26 | 261 | 52 | 145 | 52 | 29 | 3,483 |
| Paid to salaried employees | $16,000 | $291,874 | $17,400 | $95,878 | $34,884 | $12,998 | $738,896 |
| Paid to wage earners | $22,382 | $202,944 | $45,580 | $138,817 | $38,177 | $24,483 | $2,341,534 |
| Total salaries and wages | $38,382 | $494,818 | $62,980 | $234,695 | $73,061 | $37,481 | $3,080,430 |
| Fishermen manufacturing | 7 | 3 | | | | | 216 |

*Industries related to the fisheries of the Mississippi River and Tributaries*—Contd.

PRODUCTS MANUFACTURED

| Item | Indiana | | Illinois, Iowa, and Missouri | | Louisiana | |
|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments: | | | | | | |
| Salmon, smoked pounds | | | 240,000 | $48,800 | | |
| Sturgeon, smoked do | | | 162,000 | 39,140 | | |
| Mussel-shell products: | | | | | | |
| Buttons [2] gross | | | 12,960,342 | 3,751,879 | | |
| Poultry feed [2] tons | | | 4,290 | 26,467 | | |
| Lime [2] do | | | 928 | 1,022 | | |
| Unclassified [2] | | | | [3] 29,412 | | |
| Unclassified, smoked pounds | | | [4] 83,000 | [4] 14,440 | | |
| Total | | | | 3,911,160 | | |
| By fishermen: | | | | | | |
| Alligator hides pounds | | | | | 88,356 | $7,363 |
| Carp, smoked do | | | 667 | 67 | | |
| Paddlefish, roe, salted do | 450 | $180 | 900 | 540 | | |
| Sheepshead, smoked do | | | 617 | 77 | | |
| Sturgeon: | | | | | | |
| Smoked do | | | 1,333 | 400 | | |
| Roe, salted do | | | 35 | 32 | | |
| Total | 450 | 180 | 3,552 | 1,116 | 88,356 | 7,363 |
| Grand total | 450 | 180 | | 3,912,276 | 88,356 | 7,363 |

| Item | Minnesota and Nebraska | | Mississippi | | Ohio, Tennessee, and Pennsylvania | |
|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments: | | | | | | |
| Chubs, smoked pounds | | | | | 106,600 | $26,650 |
| Salmon, smoked do | (1) | (1) | | | (1) | (1) |
| Sturgeon, smoked do | (1) | (1) | | | | |
| Whitefish, smoked do | 255,000 | $47,200 | | | (1) | (1) |
| Unclassified, smoked do | [5] 66,600 | [5] 19,793 | | | [6] 184,900 | [6] 50,555 |
| Total | 321,600 | 66,993 | | | 291,500 | 77,205 |
| By fishermen, paddlefish roe, salted do | | | 245 | $92 | | |
| Grand total | 321,600 | 66,993 | 245 | 92 | 291,500 | 77,205 |

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[1] The production of this item is included under unclassified products.
[2] Data are for 1937.
[3] Includes mussel-shell chips and novelties.
[4] Includes smoked buffalofish and tullibees.
[5] Includes smoked eels, salmon, and sturgeon.
[6] Includes smoked buffalofish, butterfish, carp, lake trout, paddlefish, sablefish, salmon, tullibees, and whitefish.

NOTE.—Unless otherwise indicated the data are for 1931. The total value of the manufactured products for the States of the Mississippi River and tributaries was as follows: By manufacturing establishments $4,055,358; and by fishermen $8,751. Some of the products may have been manufactured from fishery products imported from another State or a foreign country, therefore, they cannot be correlated directly with the catch within the State.

## LAKE PEPIN

### *Fisheries of Lake Pepin, 1937*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Trammel nets | Trot lines | Total, exclusive of duplication |
|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* |
| Regular | 7 | 13 | | 20 |
| Casual | 11 | 15 | 40 | 47 |
| Total | 18 | 28 | 40 | 67 |
| Boats: | | | | |
| Motor | 6 | 12 | 5 | 23 |
| Other | 9 | 13 | 38 | 56 |
| Apparatus: | | | | |
| Number | 7 | 13 | 40 | |
| Length, yards | 2,332 | | | |
| Square yards | | 21,450 | | |
| Hooks | | | 4,000 | |

CATCH: BY GEAR

| Species | Haul seines | | Trammel nets | | Trot lines | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | 12,200 | $122 | | | | | 12,200 | $122 |
| Buffalofish | 25,000 | 895 | 12,500 | $435 | | | 37,500 | 1,330 |
| Carp | 224,200 | 5,184 | 125,300 | 2,956 | 2,000 | $46 | 351,500 | 8,186 |
| Catfish and bullheads | 2,000 | 280 | 14,800 | 1,832 | 15,600 | 2,046 | 32,400 | 4,158 |
| Sheepshead | 22,300 | 912 | 6,600 | 276 | 2,700 | 135 | 31,600 | 1,323 |
| Sucker "mullet" | 9,000 | 90 | | | | | 9,000 | 90 |
| Turtles, snapper | | | | | 600 | 48 | 600 | 48 |
| Total | 294,700 | 7,483 | 159,200 | 5,499 | 20,900 | 2,275 | 474,800 | 15,257 |

OPERATING UNITS: BY STATES

| Item | Minnesota | Wisconsin | Total for lake |
|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* |
| Regular | | 20 | 20 |
| Casual | 9 | 38 | 47 |
| Total | 9 | 58 | 67 |
| Boats: | | | |
| Motor | 2 | 21 | 23 |
| Other | 7 | 49 | 56 |
| Apparatus: | | | |
| Haul seines | | 7 | 7 |
| Length, yards | | 2,332 | 2,332 |
| Trammel nets | | 13 | 13 |
| Square yards | | 21,450 | 21,450 |
| Trot lines | 9 | 31 | 40 |
| Hooks | 900 | 3,100 | 4,000 |

*Fisheries of Lake Pepin, 1937*—Continued

CATCH: BY STATES

| Species | Minnesota | | Wisconsin | | Total for lake | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | | | 12,200 | $122 | 12,200 | $122 |
| Buffalofish | | | 37,500 | 1,330 | 37,500 | 1,330 |
| Carp | 2,000 | $46 | 349,500 | 8,140 | 351,500 | 8,186 |
| Catfish and bullheads | 6,600 | 924 | 25,800 | 3,234 | 32,400 | 4,158 |
| Sheepshead | 2,700 | 135 | 28,900 | 1,188 | 31,600 | 1,323 |
| Sucker "mullet" | | | 9,000 | 90 | 9,000 | 90 |
| Turtles, snapper | 600 | 48 | | | 600 | 48 |
| Total | 11,900 | 1,153 | 462,900 | 14,104 | 474,800 | 15,257 |

## LAKE KEOKUK

*Fisheries of Lake Keokuk, 1937*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Trammel nets | Trot lines | Fyke nets | Total, exclusive of duplication |
|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| Regular | 25 | 2 | 7 | 29 | 53 |
| Casual | 61 | 33 | 65 | 104 | 123 |
| Total | 86 | 35 | 72 | 133 | 176 |
| Boats: | | | | | |
| Motor | 20 | 16 | 39 | 91 | 111 |
| Other | 28 | 6 | 33 | 68 | 107 |
| Apparatus: | | | | | |
| Number | 24 | 34 | 224 | 2,205 | |
| Length, yards | 3,250 | | | | |
| Square yards | | 3,800 | | | |
| Hooks | | | 21,000 | | |

CATCH: BY GEAR

| Species | Haul seines | | Trammel nets | | Trot lines | | Fyke nets | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | 3,900 | $78 | | | | | | | 3,900 | $78 |
| Buffalofish | 84,800 | 3,393 | 19,500 | $780 | | | 90,700 | $3,585 | 195,000 | 7,758 |
| Carp | 231,600 | 4,651 | 49,000 | 980 | | | 247,100 | 5,183 | 527,700 | 10,814 |
| Catfish and bullheads | 15,600 | 1,564 | | | 38,200 | $3,819 | 116,700 | 11,674 | 170,500 | 17,057 |
| Eels | | | | | | | 100 | 5 | 100 | 5 |
| Paddlefish or spoonbill cat | 8,700 | 870 | 2,000 | 200 | 2,000 | 200 | 500 | 50 | 13,200 | 1,320 |
| Sheepshead | 86,800 | 4,382 | 16,000 | 800 | 1,000 | 50 | 62,500 | 3,318 | 166,300 | 8,550 |
| Sturgeon, shovelnose | 300 | 30 | | | 1,000 | 100 | | | 1,300 | 130 |
| Sucker "mullet" | 1,000 | 15 | | | | | | | 1,000 | 15 |
| Turtles: | | | | | | | | | | |
| Snapper | 2,500 | 50 | | | | | 1,500 | 65 | 4,000 | 115 |
| Soft-shell | 500 | 25 | | | | | | | 500 | 25 |
| Total | 435,700 | 15,058 | 86,500 | 2,760 | 42,200 | 4,169 | 519,100 | 23,880 | 1,083,500 | 45,867 |

*Fisheries of Lake Keokuk, 1937*—Continued

OPERATING UNITS: BY STATES

| Item | Illinois | Iowa | Total for lake |
|---|---|---|---|
| Fishermen: | | | |
| Regular | 27 | 26 | 53 |
| Casual | 57 | 66 | 123 |
| Total | 84 | 92 | 176 |
| Boats: | | | |
| Motor | 54 | 57 | 111 |
| Other | 48 | 59 | 107 |
| Apparatus: | | | |
| Haul seines | 3 | 21 | 24 |
| Length, yards | 550 | 2,700 | 3,250 |
| Trammel nets | | 34 | 34 |
| Square yards | | 3,800 | 3,800 |
| Trot lines | 104 | 120 | 224 |
| Hooks | 12,000 | 9,000 | 21,000 |
| Fyke nets | 1,479 | 726 | 2,205 |

CATCH: BY STATES

| Species | Illinois | | Iowa | | Total | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | 900 | $18 | 3,000 | $60 | 3,900 | $78 |
| Buffalofish | 70,000 | 2,801 | 125,000 | 4,957 | 195,000 | 7,758 |
| Carp | 216,700 | 4,597 | 311,000 | 6,217 | 527,700 | 10,814 |
| Catfish and bullheads | 91,900 | 9,194 | 78,600 | 7,863 | 170,500 | 17,057 |
| Eels | | | 100 | 5 | 100 | 5 |
| Paddlefish or spoonbill cat | 8,500 | 850 | 4,700 | 470 | 13,200 | 1,320 |
| Sheepshead | 63,500 | 3,418 | 102,800 | 5,132 | 166,300 | 8,550 |
| Sturgeon, shovelnose | | | 1,300 | 130 | 1,300 | 130 |
| Sucker "mullet" | 500 | 10 | 500 | 5 | 1,000 | 15 |
| Turtles: | | | | | | |
| Snapper | 1,500 | 65 | 2,500 | 50 | 4,000 | 115 |
| Soft-shell | | | 500 | 25 | 500 | 25 |
| Total | 453,500 | 20,953 | 630,000 | 24,914 | 1,083,500 | 45,867 |

## MISSISSIPPI RIVER BETWEEN LAKE PEPIN AND LAKE KEOKUK

*Fisheries of the Mississippi River between Lake Pepin and Lake Keokuk, 1937*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Anchor gill nets | Trammel nets | Trot lines | Pound nets | Fyke nets | Dip nets | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Regular | 81 | 7 | 54 | 11 | 6 | 102 | | 229 |
| Casual | 206 | 9 | 108 | 204 | 7 | 140 | 16 | 573 |
| Total | 287 | 16 | 162 | 215 | 13 | 242 | 16 | 802 |
| Boats: | | | | | | | | |
| Motor | 97 | 8 | 63 | 47 | 5 | 194 | 1 | 345 |
| Other | 104 | 8 | 78 | 180 | 7 | 216 | 10 | 505 |
| Apparatus: | | | | | | | | |
| Number | 87 | 9 | 409 | 378 | 48 | 5,012 | 16 | |
| Length, yards | 14,955 | | | | | | | |
| Square yards | | 6,162 | 30,190 | | | | | |
| Hooks | | | | 36,600 | | | | |

*Fisheries of the Mississippi River between Lake Pepin and Lake Keokuk, 1937*—Con.

CATCH: BY GEAR

| Species | Haul seines | | Anchor gill nets | | Trammel nets | | Trot lines | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | 97, 800 | $1, 397 | | | 4, 600 | $46 | | |
| Buffalofish | 354, 000 | 13, 720 | 3, 500 | $131 | 193, 100 | 7, 803 | 2, 200 | $86 |
| Carp | 891, 900 | 22, 525 | 16, 900 | 432 | 461, 300 | 10, 517 | 10, 600 | 277 |
| Catfish and bullheads | 17, 400 | 1, 791 | 2, 100 | 252 | 44, 500 | 4, 624 | 149, 300 | 15, 251 |
| Eels | | | | | | | 300 | 30 |
| Paddlefish or spoonbill cat | | | | | | | 5, 600 | 560 |
| Pike or pickerel | 1, 700 | 129 | | | 2, 100 | 168 | 200 | 12 |
| Sheepshead | 183, 500 | 9, 161 | | | 51, 900 | 2, 907 | 11, 900 | 601 |
| Sturgeon, shovelnose | 800 | 128 | | | 10, 000 | 1, 226 | 7, 200 | 910 |
| Sucker "mullet" | 33, 400 | 456 | | | 2, 300 | 46 | | |
| Turtles: | | | | | | | | |
| Snapper | 1, 900 | 80 | | | | | | |
| Soft-shell | 3, 300 | 295 | | | | | | |
| Total | 1, 585, 700 | 49, 682 | 22, 500 | 815 | 769, 800 | 27, 337 | 187, 300 | 17, 727 |

| Species | Pound nets | | Fyke nets | | Dip nets | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | | | 21, 800 | $303 | | | 124, 200 | $1, 746 |
| Buffalofish | 8, 900 | $291 | 264, 900 | 10, 272 | 7, 000 | $350 | 833, 600 | 32, 653 |
| Carp | 24, 500 | 490 | 591, 700 | 14, 269 | 5, 200 | 208 | 2, 002, 100 | 48, 718 |
| Catfish and bullheads | 4, 300 | 374 | 312, 600 | 30, 213 | | | 530, 200 | 52, 505 |
| Eels | | | 200 | 23 | | | 500 | 53 |
| Paddlefish or spoonbill cat | | | 3, 600 | 356 | | | 9, 200 | 916 |
| Pike or pickerel | | | 12, 700 | 813 | | | 16, 700 | 1, 122 |
| Sheepshead | 7, 400 | 286 | 163, 200 | 8, 053 | 4, 000 | 200 | 421, 900 | 21, 208 |
| Sturgeon, shovelnose | 1, 100 | 176 | 22, 300 | 2, 459 | | | 41, 400 | 4, 899 |
| Sucker "mullet" | | | 2, 800 | 56 | | | 38, 500 | 558 |
| Turtles: | | | | | | | | |
| Snapper | | | 1, 600 | 80 | | | 3, 500 | 160 |
| Soft-shell | | | 1, 600 | 55 | | | 4, 900 | 350 |
| Total | 46, 200 | 1, 617 | 1, 399, 000 | 66, 952 | 16, 200 | 758 | 4, 026, 700 | 164, 888 |

OPERATING UNITS: BY STATES

| Item | Illinois | Iowa | Minnesota | Wisconsin | Total |
|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| Regular | 54 | 104 | 6 | 65 | 229 |
| Casual | 158 | 241 | 50 | 124 | 573 |
| Total | 212 | 345 | 56 | 189 | 802 |
| Boats: | | | | | |
| Motor | 118 | 159 | 13 | 55 | 345 |
| Other | 108 | 248 | 44 | 105 | 505 |
| Apparatus: | | | | | |
| Haul seines | 16 | 36 | 5 | 30 | 87 |
| Length, yards | 2, 450 | 5, 282 | 998 | 6, 225 | 14, 955 |
| Anchor gill nets | | | 2 | 7 | 9 |
| Square yards | | | 2, 666 | 3, 496 | 6, 162 |
| Trammel nets | 341 | 46 | | 22 | 409 |
| Square yards | 935 | 8, 201 | | 21, 054 | 30, 190 |
| Lines, trot | 73 | 218 | 43 | 44 | 378 |
| Hooks | 7, 500 | 20, 400 | 4, 300 | 4, 400 | 36, 600 |
| Pound nets | | 48 | | | 48 |
| Fyke nets | 2, 087 | 2, 599 | | 326 | 5, 012 |
| Dip nets | | 16 | | | 16 |

*Fisheries of the Mississippi River between Lake Pepin and Lake Keokuk, 1937*—Con.

CATCH: BY STATES

| Species | Illinois | | Iowa | | Minnesota | | Wisconsin | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | 4, 200 | $44 | 56, 300 | $668 | 500 | $8 | 63, 200 | $1, 026 | 124, 200 | $1, 746 |
| Buffalofish | 177, 500 | 6, 983 | 415, 000 | 16, 305 | 12, 900 | 495 | 228, 200 | 8, 870 | 833, 600 | 32, 653 |
| Carp | 356, 600 | 8, 202 | 773, 000 | 16, 545 | 87, 800 | 2, 360 | 784, 700 | 21, 611 | 2, 002, 100 | 48, 718 |
| Catfish and bullheads | 146, 900 | 14, 921 | 275, 600 | 25, 909 | 27, 200 | 2, 920 | 80, 500 | 8, 755 | 530, 200 | 52, 505 |
| Eels | 100 | 12 | 400 | 41 | -------- | ------- | -------- | ------- | 500 | 53 |
| Paddlefish or spoonbill cat | 3, 700 | 366 | 5, 500 | 550 | -------- | ------- | -------- | ------- | 9, 200 | 916 |
| Pike or pickerel | -------- | ------- | 16, 700 | 1, 122 | -------- | ------- | -------- | ------- | 16, 700 | 1, 122 |
| Sheepshead | 134, 500 | 6, 626 | 195, 000 | 9, 676 | 12, 500 | 627 | 79, 900 | 4, 279 | 421, 900 | 21, 208 |
| Sturgeon, shovelnose | -------- | ------- | 41, 400 | 4, 899 | -------- | ------- | -------- | ------- | 41, 400 | 4, 899 |
| Sucker "mullet" | 5, 500 | 96 | 17, 800 | 275 | -------- | ------- | 15, 200 | 187 | 38, 500 | 558 |
| Turtles: | | | | | | | | | | |
| Snapper | 600 | 12 | 2, 900 | 148 | -------- | ------- | -------- | ------- | 3, 500 | 160 |
| Soft-shell | 1, 000 | 32 | 3, 900 | 318 | -------- | ------- | -------- | ------- | 4, 900 | 350 |
| Total | 830, 600 | 37, 294 | 1, 803, 500 | 76, 456 | 140, 900 | 6, 410 | 1, 251, 700 | 44, 728 | 4, 026, 700 | 164. 888 |

## FISHERIES OF ALASKA [13]

The commercial catch of fishery products in Alaska during 1937, exclusive of whales, amounted to 825,783,422 pounds, valued at $14,237,771, which is a decrease of 11 percent in quantity but an increase of 2 percent in value as compared with the catch in 1936. Of the total catch in 1937, 593,383,891 pounds, valued at $11,876,351, consisted of salmon; 229,340,640 pounds, valued at $2,142,306, other fish; and 3,058,891 pounds, valued at $219,114, shellfish. In addition, 376 whales were taken. These fisheries gave employment to 11,570 fishermen, 2,159 persons on transporting craft, and 16,602 persons in fishery wholesale and manufacturing industries—a total of 30,331 persons, which is a decrease of less than one half of one percent as compared with the number employed in 1936.

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[13] Statistics for the fisheries of Alaska are collected and compiled by the Alaska Division of this Bureau. A summary of these statistics appears in this section. For detailed figures the reader is referred to "Alaska Fishery and Fur Seal Industries," by Ward T. Bower, Appendix II to the report of the Commissioner of Fisheries for the fiscal year 1938.

## *Fisheries of Alaska, 1937*

### SUMMARY: BY DISTRICTS

| Item | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| PERSONS ENGAGED | *Number* | *Value* | *Number* | *Value* | *Number* | *Value* | *Number* | *Value* |
| In fishing | 5, 278 | | 2, 989 | | 3, 303 | | 11, 570 | |
| In transporting | 950 | | 745 | | 464 | | 2, 159 | |
| In wholesale and manufacturing industries | 7, 474 | | 4, 677 | | 4, 451 | | 16, 602 | |
| Total | 13, 702 | | 8, 411 | | 8, 218 | | 30, 331 | |
| CRAFT EMPLOYED | | | | | | | | |
| Vessels fishing | 774 | | 87 | | 11 | | 872 | |
| Boats fishing | 2, 206 | | 1, 554 | | 1, 426 | | 5, 186 | |
| Vessels transporting | 198 | | 140 | | 90 | | 428 | |
| Scows, houseboats, pile drivers, etc | 311 | | 267 | | 197 | | 775 | |
| Total | 3, 489 | | 2, 048 | | 1, 724 | | 7, 261 | |
| CATCH | | | | | | | | |
| Fish: | *Pounds* | | *Pounds* | | *Pounds* | | *Pounds* | |
| Salmon | 252, 350, 760 | $4, 537, 572 | 191, 902, 005 | $3, 512, 242 | 149, 131, 126 | $3, 826. 537 | 593, 383, 891 | $11, 876, 351 |
| Other | 111, 029, 442 | 1, 538, 304 | 118, 096, 489 | 602, 874 | 214, 709 | 1, 128 | 229, 340, 640 | 2, 142, 306 |
| Shellfish | 1, 249, 540 | 72, 737 | 1, 809, 351 | 146, 377 | | | 3, 058, 891 | 219, 114 |
| Total | 364, 629, 742 | 6, 148, 613 | 311, 807, 845 | 4, 261, 493 | 149, 345, 835 | 3, 827, 665 | 825, 783, 422 | 14, 237, 771 |
| | *Number* | | *Number* | | *Number* | | *Number* | |
| Whales | | | 120 | | 256 | | 376 | |
| WHOLESALE AND MANUFACTURING | | | | | | | | |
| Establishments | 103 | | 97 | | 36 | | 236 | |
| PRODUCTS AS PREPARED FOR MARKET | *Pounds* | | *Pounds* | | *Pounds* | | *Pounds* | |
| Salmon | 157, 088, 189 | 17, 794, 401 | 107, 456, 903 | 13, 773, 497 | 74, 636, 380 | 15, 006, 030 | 339, 181, 472 | 46, 573, 928 |
| Herring | 35, 957, 937 | 1, 119, 410 | 50, 750, 224 | 1, 769, 908 | 40, 275 | 2, 536 | 86, 748, 436 | 2, 891, 854 |
| Halibut | 13, 277, 064 | 991, 529 | 150, 617 | 13, 100 | | | 13, 427, 681 | 1, 004, 629 |
| Cod | | | 154, 724 | 8, 164 | 48, 603 | 2, 174 | 203, 327 | 10, 338 |
| Trout | 61, 999 | 4, 848 | | | | | 61, 999 | 4, 848 |
| Sablefish | 2, 102, 967 | 91, 313 | | | | | 2, 102, 967 | 91, 313 |
| Smelt | 275 | 8 | | | | | 275 | 8 |
| Flounder | 180, 000 | 4, 500 | | | | | 180, 000 | 4, 500 |
| Rockfish | 16, 843 | 336 | | | | | 16, 843 | 336 |
| "Lingcod" | 3, 007 | 921 | | | | | 3, 007 | 921 |
| Clam | 3, 432 | 977 | 405, 039 | 239, 415 | | | 408, 471 | 240, 392 |
| Shrimp | 453, 521 | 161, 098 | 9, 864 | 3, 835 | | | 463, 385 | 164, 933 |
| Crab | 216, 797 | 80, 644 | 494, 521 | 195, 455 | | | 711, 318 | 276, 099 |
| Whale | | | 2, 419, 500 | 128, 703 | 6, 616, 000 | 350, 418 | 9, 035, 500 | 479, 121 |
| Total | 209, 362, 031 | 20, 249, 985 | 161, 841, 392 | 16, 132, 077 | 81, 341, 258 | 15, 361, 158 | 452, 544, 681 | 51, 743, 220 |

## *Fisheries of Alaska, 1937*—Continued

OPERATING UNITS: BY DISTRICTS

| Item | South-east Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* |
| Fishermen | 5,278 | 2,989 | 3,303 | 11,570 |
| Vessels fishing: | | | | |
| Steam | | 3 | 3 | 6 |
| Net tonnage | | 207 | 281 | 488 |
| Motor | 774 | 84 | 8 | 866 |
| Net tonnage | 9,638 | 1,962 | 247 | 11,847 |
| Boats fishing: | | | | |
| Motor | 1,047 | 605 | 40 | 1,692 |
| Other | 1,159 | 949 | 1,386 | 3,494 |
| Apparatus: | | | | |
| Traps | 284 | 169 | | 453 |
| Purse seines | 575 | 279 | 8 | 862 |
| Yards | 196,082 | 62,240 | 4,400 | 262,722 |
| Haul seines | 6 | 203 | | 209 |
| Yards | 1,200 | 39,038 | | 40,238 |
| Apparatus—Continued. | *Number* | *Number* | *Number* | *Number* |
| Gill nets | 384 | 1,537 | 2,200 | 4,121 |
| Yards | 49,920 | 199,140 | 343,562 | 592,622 |
| Beam trawls | 12 | 1 | | 13 |
| Wheels | | | 255 | 255 |
| Lines: | | | | |
| Hand lines (cod fishery) | | 21 | 15 | 36 |
| Trawl lines (cod fishery) | | 3 | 3 | 6 |
| Troll lines | 3,718 | | | 3,718 |
| Skates of lines (halibut fishery) | 3,538 | | | 3,538 |
| Crab pots | 2,973 | 506 | | 3,479 |
| Herring pounds | 4 | | | 4 |
| Herring pound seines | 9 | | | 9 |

## CATCH: By districts

[Estimated round weight and value to fishermen]

| Item | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| FISH | | | | | | | | |
| Salmon: | | | | | | | | |
| Blueback, red or sockeye | 15, 310, 337 | $478, 040 | 40, 316, 310 | $1, 237, 225 | 137, 832, 281 | $3, 742, 657 | 193, 458, 928 | $5, 457, 922 |
| Chinook or king | 17, 589, 560 | 439, 694 | 2, 228, 140 | 88, 686 | 1, 617, 460 | 20, 920 | 21, 435, 160 | 549, 300 |
| Chum or keta | 50, 004, 090 | 604, 847 | 20, 797, 623 | 227, 206 | 9, 662, 913 | 62, 543 | 80, 464, 626 | 894, 596 |
| Humpback or pink | 158, 248, 741 | 2, 754, 133 | 124, 034, 804 | 1, 861, 535 | 944 | 1 | 282, 284, 489 | 4, 615, 669 |
| Silver or coho | 11, 198, 032 | 260, 858 | 4, 525, 128 | 97, 590 | 17, 528 | 416 | 15, 740, 688 | 358, 864 |
| Herring | 88, 969, 788 | 444, 849 | 117, 415, 746 | 587, 079 | 60, 112 | 300 | 206, 445, 646 | 1, 032, 228 |
| Halibut | 18, 762, 234 | 991, 529 | 211, 596 | 13, 100 | | | 18, 973, 830 | 1, 004, 629 |
| Cod | | | 469, 147 | 2, 695 | 154, 597 | 828 | 623, 744 | 3, 523 |
| Trout: | | | | | | | | |
| Dolly Varden | 55, 356 | 3, 221 | | | | | 55, 356 | 3, 221 |
| Steelhead | 22, 142 | 1, 627 | | | | | 22, 142 | 1, 627 |
| Sablefish | 2, 990, 272 | 91, 313 | | | | | 2, 990, 272 | 91, 313 |
| Smelt | 413 | 8 | | | | | 413 | 8 |
| Flounder | 200, 000 | 4, 500 | | | | | 200, 000 | 4, 500 |
| Rockfishes | 25, 912 | 336 | | | | | 25, 912 | 336 |
| "Lingcod" | 3, 325 | 921 | | | | | 3, 325 | 921 |
| Total | 363, 380, 202 | 6, 075, 876 | 309, 998, 494 | 4, 115, 116 | 149, 345, 835 | 3, 827, 665 | 822, 724, 531 | 14, 018, 657 |
| SHELLFISH | | | | | | | | |
| Crabs: | | | | | | | | |
| Dungeness | 416, 315 | 40, 066 | 976, 706 | 97, 528 | | | 1, 393, 021 | 137, 594 |
| King | 3, 504 | 256 | 2, 736 | 199 | | | 6, 240 | 455 |
| Shrimp | 822, 857 | 32, 220 | 19, 831 | 767 | | | 842, 688 | 32, 987 |
| Clams: | | | | | | | | |
| Butter | 6, 864 | 195 | 6, 000 | 400 | | | 12, 864 | 595 |
| Razor | | | 804, 078 | 47, 483 | | | 804, 078 | 47, 483 |
| Total | 1, 249, 540 | 72, 737 | 1, 809, 351 | 146, 377 | | | 3, 058, 891 | 219, 114 |
| Grand total | 364, 629, 742 | 6, 148, 613 | 311, 807, 845 | 4, 261, 493 | 149, 345, 835 | 3, 827, 665 | 825, 783, 422 | 14, 237, 771 |

NOTE.—In addition to the above statistics, 376 whales were taken in Alaska waters. The round weight and value to fishermen cannot be determined, but the products amounted to 9,035,500 pounds, valued at $479,121.

*Industries related to the fisheries of Alaska, 1937*

TRANSPORTING

| Item | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* |
| Persons engaged | 950 | 745 | 464 | 2,159 |
| Vessels transporting: | | | | |
| Steam | | | 7 | 7 |
| Net tonnage | | | 23,986 | 23,986 |
| Vessels transporting—Continued, | | | | |
| Motor | 198 | 140 | 83 | 421 |
| Net tonnage | 5,855 | 6,573 | 2,077 | 14,505 |
| Scows, houseboats, pile drivers, etc | 311 | 267 | 197 | 775 |

WHOLESALE AND MANUFACTURING

| Item | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* |
| Persons engaged | 7,474 | 4,677 | 4,451 | 16,602 |
| Establishments: | | | | |
| Handling fresh and frozen fish | 49 | 9 | | 58 |
| Curing fish | 27 | 48 | 18 | 93 |
| Canning fish | 52 | 49 | 23 | 124 |
| Manufacturing byproducts | 9 | 12 | 1 | 22 |
| Total (exclusive of duplication) | 103 | 97 | 36 | 236 |

## PRODUCTS AS PREPARED FOR MARKET

| Item | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| FRESH | | | | | | | | |
| Salmon (for food) | 3,421,129 | $292,316 | | | | | 3,421,129 | $292,316 |
| Herring (for bait) | 2,674,260 | 31,180 | 57,125 | $656 | | | 2,731,385 | 31,836 |
| Halibut | 6,136,109 | 419,959 | | | | | 6,136,109 | 419,959 |
| Halibut livers | 143,500 | 71,750 | 2,500 | 1,250 | | | 146,000 | 73,000 |
| Trout | 41,740 | 2,966 | | | | | 41,740 | 2,966 |
| Sablefish | 4,063 | 110 | | | | | 4,063 | 110 |
| Sablefish livers | 69,582 | 27,833 | | | | | 69,582 | 27,833 |
| Flounder | 180,000 | 4,500 | | | | | 180,000 | 4,500 |
| "Lingcod" livers | 2,264 | 906 | | | | | 2,264 | 906 |
| Crabs: | | | | | | | | |
| Meat | 56,598 | 20,510 | 5,916 | 2,549 | | | 62,514 | 23,059 |
| Whole, in shell | 13,775 | 1,152 | 9,600 | 640 | | | 23,375 | 1,792 |
| Shrimp: | | | | | | | | |
| Meat | 444,844 | 158,155 | 8,926 | 3,534 | | | 453,770 | 161,689 |
| Whole, in shell | 2,110 | 316 | 50 | 5 | | | 2,160 | 321 |
| Total | 13,189,974 | 1,031,653 | 84,117 | 8,634 | | | 13,274,091 | 1,040,287 |
| FROZEN | | | | | | | | |
| Salmon (for food) | 5,344,666 | 431,614 | | | | | 5,344,666 | 431,614 |
| Salmon (for bait) | 59,750 | 634 | | | | | 59,750 | 634 |
| Herring (for bait) | 2,506,787 | 16,980 | | | | | 2,506,787 | 16,980 |
| Halibut | 6,996,102 | 499,750 | 148,117 | 11,850 | | | 7,144,219 | 511,600 |
| Halibut cheeks | 1,353 | 70 | | | | | 1,353 | 70 |
| Trout | 20,259 | 1,882 | | | | | 20,259 | 1,882 |
| Sablefish | 1,839,137 | 56,576 | | | | | 1,839,137 | 56,576 |
| Smelt | 275 | 8 | | | | | 275 | 8 |
| Rockfishes | 16,843 | 336 | | | | | 16,843 | 336 |
| "Lingcod" | 743 | 15 | | | | | 743 | 15 |
| Shrimp | 6,567 | 2,627 | | | | | 6,567 | 2,627 |
| Total | 16,792,482 | 1,010,492 | 148,117 | 11,850 | | | 16,940,599 | 1,022,342 |
| CURED | | | | | | | | |
| Salmon: | | | | | | | | |
| Mild-cured | 5,620,800 | 1,051,744 | | | 100,800 | $12,600 | 5,721,600 | 1,064,344 |
| Pickled | 18,800 | 1,574 | 290,696 | 37,803 | 455,900 | 61,173 | 765,396 | 100,550 |
| Dry-salted | | | 11,725 | 1,900 | | | 11,725 | 1,900 |
| Dried | | | | | 1,148,000 | 79,900 | 1,148,000 | 79,900 |
| Herring: | | | | | | | | |
| Pickled (for food), Scotch-cure | 72,750 | 4,161 | 1,995,415 | 101,656 | 29,875 | 2,151 | 2,098,040 | 107,968 |
| Roused | | | | | 10,400 | 385 | 10,400 | 385 |
| Spiced | 350 | 75 | | | | | 350 | 75 |
| Cod: | | | | | | | | |
| Dry-salted | | | 98,684 | 3,635 | 42,090 | 1,554 | 140,774 | 5,189 |
| Pickled | | | 34,950 | 1,668 | 5,560 | 468 | 40,510 | 2,136 |
| Stockfish | | | 21,090 | 2,861 | 953 | 152 | 22,043 | 3,013 |
| Sablefish, pickled | 190,185 | 6,794 | | | | | 190,185 | 6,794 |
| Total | 5,902,885 | 1,064,348 | 2,452,560 | 149,523 | 1,793,578 | 158,383 | 10,149,023 | 1,372,254 |

## *Industries related to the fisheries of Alaska, 1937*—Continued

### PRODUCTS AS PREPARED FOR MARKET—Continued

| Item | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| CANNED | | | | | | | | |
| Salmon: | | | | | | | | |
| Blueback, red or sockeye | 8, 051, 712 | $1, 873, 980 | 22, 187, 568 | $4, 820, 456 | 70, 880, 832 | $14, 619, 402 | 101, 120, 112 | $21, 313, 838 |
| Chinook or king | 1, 473, 264 | 282, 133 | 1, 518, 912 | 341, 519 | 342, 288 | 66, 887 | 3, 334, 464 | 690, 539 |
| Chum or keta | 24, 180, 768 | 2, 320, 377 | 9, 197, 280 | 890, 584 | 1, 701, 888 | 165, 033 | 35, 079, 936 | 3, 375, 994 |
| Humpback or pink | 102, 872, 064 | 10, 763, 188 | 71, 146, 080 | 7, 286, 290 | 48 | 5 | 174, 018, 192 | 18, 049, 483 |
| Silver or coho | 4, 249, 200 | 738, 507 | 2, 335, 392 | 378, 378 | 6, 624 | 1, 030 | 6, 591, 216 | 1, 117, 915 |
| Kippered salmon | 7, 536 | 1, 794 | | | | | 7, 536 | 1, 794 |
| Clams | 3, 432 | 977 | 405, 039 | 239, 415 | | | 408, 471 | 240, 392 |
| Crabs | 146, 424 | 58, 982 | 479, 005 | 192, 266 | | | 625, 429 | 251, 248 |
| Shrimp | | | 888 | 296 | | | 888 | 296 |
| Total | 140, 984, 400 | 16, 039, 938 | 107, 270, 164 | 14, 149, 204 | 72, 931, 680 | 14, 852, 357 | 321, 186, 244 | 45, 041, 499 |
| BYPRODUCTS | | | | | | | | |
| Meal: | | | | | | | | |
| Salmon | 1, 400, 000 | 21, 000 | 572, 000 | 8, 151 | | | 1, 972, 000 | 29, 151 |
| Whale | | | 660, 000 | 8, 730 | 1, 750, 000 | 24, 075 | 2, 410, 000 | 32, 805 |
| Herring | 15, 899, 608 | 277, 997 | 21, 732, 926 | 351, 272 | | | 37, 632, 534 | 629, 269 |
| Oil: | | | | | | | | |
| Salmon | 388, 500 | 15, 540 | 197, 250 | 8, 416 | | | 585, 750 | 23, 956 |
| Herring | 14, 804, 182 | 789, 017 | 26, 964, 758 | 1, 316, 324 | | | 41, 768, 940 | 2, 105, 341 |
| Whale | | | 1, 462, 125 | 109, 172 | 3, 901, 500 | 291, 312 | 5, 363, 625 | 400, 484 |
| Sperm | | | 297, 375 | 10, 801 | 964, 500 | 35, 031 | 1, 261, 875 | 45, 832 |
| Total | 32, 492, 290 | 1, 103, 554 | 51, 886, 434 | 1, 812, 866 | 6, 616, 000 | 350, 418 | 90, 991, 724 | 3, 266, 838 |
| Grand total | 209, 362, 031 | 20, 249, 985 | 161, 841, 392 | 16, 132, 077 | 81, 341, 258 | 15, 361, 158 | 452, 544, 681 | 51, 743, 220 |

NOTE.—The output of fresh and frozen halibut includes all fares of the Alaska fleet, some of which were landed at other than Alaska ports. The amount of livers landed by the Alaska fleet has not been reported, and the quantity shown herein is the estimated amount landed in Alaska. The total landings of halibut, other than livers, in Alaska in 1937 mounted to 8,705,204 pounds, valued at $557,911 (including 3,000 pounds, valued at $190, landed by Canadian vessels).

*Supplementary table showing the pack of canned products in "standard cases"* [1]

| Item | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| Salmon: | | | | | | | | |
| Blueback, red or sockeye | 167, 744 | $1, 873, 980 | 462, 241 | $4, 820, 456 | 1, 476, 684 | $14, 619, 402 | 2, 106, 669 | $21, 313, 838 |
| Chinook or king | 30, 693 | 282, 133 | 31, 644 | 341, 519 | 7, 131 | 66, 887 | 69, 468 | 690, 539 |
| Chum or keta | 503, 766 | 2, 320, 377 | 191, 610 | 890, 584 | 35, 456 | 165, 033 | 730, 832 | 3, 375, 994 |
| Humpback or pink | 2, 143, 168 | 10, 763, 188 | 1, 482, 210 | 7, 286, 290 | 1 | 5 | 3, 625, 379 | 18, 049, 483 |
| Silver or coho | 88, 525 | 738, 507 | 48, 654 | 378, 378 | 138 | 1, 030 | 137, 317 | 1, 117, 915 |
| Kippered salmon | 157 | 1, 794 | | | | | 157 | 1, 794 |
| Clams | 229 | 977 | 27, 002 | 239, 415 | | | 27, 231 | 240, 392 |
| Crabs | 3, 051 | 58, 982 | 9, 979 | 192, 266 | | | 13, 030 | 251, 248 |
| Shrimp | | | 51 | 296 | | | 51 | 296 |
| Total | 2, 937, 333 | 16, 039, 938 | 2, 253, 391 | 14, 149, 204 | 1, 519, 410 | 14, 852, 357 | 6, 710, 134 | 45, 041, 499 |

[1] The pack of salmon, kippered salmon, and crabs has been converted to "standard cases" of 48 1-pound cans, clams to "standard cases" of 48 No. 1 5-ounce cans, and shrimp to "standard cases" of 48 5¾-ounce cans.

*Supplementary table showing the output of byproducts in tons and gallons*

| Item | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Meal: | | | | | | | | |
| Salmon tons | 700 | $21, 000 | 286 | $8, 151 | | | 986 | $29, 151 |
| Whale do | | | 330 | 8, 730 | 875 | $24, 075 | 1, 205 | 32, 805 |
| Herring do | 7, 950 | 277, 997 | 10, 866 | 351, 272 | | | 18, 816 | 629, 269 |
| Oil: | | | | | | | | |
| Salmon gallons | 51, 800 | 15, 540 | 26, 300 | 8, 416 | | | 78, 100 | 23, 956 |
| Herring do | 1, 973, 891 | 789, 017 | 3, 595, 301 | 1, 316, 324 | | | 5, 569, 192 | 2, 105, 341 |
| Whale do | | | 194, 950 | 109, 172 | 520, 200 | 291, 312 | 715, 150 | 400, 484 |
| Sperm do | | | 39, 650 | 10, 801 | 128, 600 | 35, 031 | 168, 250 | 45, 832 |
| Total | | 1, 103, 554 | | 1, 812, 866 | | 350, 418 | | 3, 266, 838 |

## WHALING[14]

The history of whaling presents one of the most romantic chapters in the annals of seafaring life. Since its inception, in the Bay of Biscay early in the twelfth century, whaling has been carried on at one time or another in all the oceans of the world.

At the beginning of the eighteenth century the New England colonists became prominent in the industry, and by 1846 there were 735 American vessels engaged in the fishery.

The American fishery continued to expand and flourish until the discovery of petroleum in the United States about 1850. Due to lower production costs, the distillation products of petroleum quickly replaced whale oil for illumination purposes. In 1871 practically the entire Arctic fleet was destroyed by ice. This catastrophe, followed by the substitution of steel for whalebone, marked the end of American supremacy.

The relentless, unrestricted pursuit of these huge marine mammals led inevitably to the virtual extermination of certain species in first one sea and then another. In 1887 new impetus was given the stricken industry by the invention of the harpoon gun by a Norwegian sailor, Svend Foyne. The harpoon gun, shooting a heavy harpoon with an exploding bomb, and mounted on the bow of fast boats of 100 to 150 tons, made it possible to capture the large finback, blue, sei, and humpback whales, which previously had been too speedy and dangerous to hunt. A few years later a violent controversy, which culminated in a successful protest by the Norwegian cod fishery, closed Norwegian waters to whaling (Norwegian Fisheries Act of Jan. 7, 1904). This led to the exploitation of distant fields, the establishment of new shore stations, and ultimately to the introduction of the huge modern factory ship. With the advent of the factory ship the Antarctic, hitherto unexplored, was invaded.

Shortly after the beginning of the twentieth century, oil chemists learned the manner of converting whale oil into hardened fat. Later, the World War created a demand for gylcerine and once more whale oil returned as an important product of commerce.

By 1930 Antarctic whaling had developed to such amazing proportions that for the first time leaders in the industry were forced to heed the warnings of eminent biologists and conservationists who had long followed with misgivings this unremitting warfare against these creatures. In 1931 the League of Nations provided for a committee of experts to consider the question. This committee adopted a Convention for the Regulation of Whaling. The Convention was signed by 26 nations, including the United States. In the United States, the Whaling Treaty Act of May 1, 1936, and the Joint Regulations of the Secretary of the Treasury and the Secretary of Commerce, of October 9, 1936, promulgated thereunder, gave effect to this Convention.

An International Whaling Conference, held in London, England, on June 8, 1937, drafted an Agreement to supplement and extend the International Convention for the Regulation of Whaling. This agreement was ratified by the United States and the new Joint

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[14] This section was prepared by Ralph A. Ferrandini, Special Whaling Agent, Law Enforcement Division.

Regulations of the Secretary of the Treasury and the Secretary of Commerce were signed by the President December 20, 1938.

The original Convention and subsequent legislation, among other things, prohibited the killing of right and gray whales; set definite limits on various other species, required the licensing of all shore stations, factory ships, and killer boats, and the collection of statistical and biological data on all whales killed.

In general it may be stated that there are virtually two groups of whales. All have their young in the tropical waters; then, accompanied by their calves, one group migrates to the Antarctic and the other to the Arctic. The Northern group leaves the tropical waters of the Caribbean Sea and Lower California in the spring or early summer, travels to the Arctic Seas, and returns along the same general route in the fall. Thus, whaling in Northern waters usually starts in May or June and ends in October.

The seasons are reversed in the Southern Hemisphere; therefore, the Southern group leaves the tropical waters off the coasts of Africa, South America, and Australia in the Antarctic spring, i. e., October, migrates to the Antarctic polar seas during the Antarctic summer and returns to tropical waters in autumn (March and April). Whaling in the Antarctic is restricted to a definite season. The season opens December 8 and closes March 7. During 1937–38 the season was extended to March 15.

The American whaling industries operated for the first time under these new regulations during the 1937–38 season. The value of the whale products are conservatively estimated at $6,000,000, and fees for whaling licenses yielded $10,250 to the Federal Government.

A Coast Guard inspector was assigned to each shore station and factory ship. Uniform methods for the collection of statistical and biological data were inaugurated by the Bureau of Fisheries. Samples of stomach contents were taken when practicable and a comprehensive report containing the results of the analyses of stomach contents, as well as detailed information concerning all American whaling operations, was prepared by the Bureau and forwarded through the State Department to the International Bureau for Whaling Statistics, Oslo, Norway.

The following tables show the extent of American participation in whaling during the 1937–38 season, as well as the total production of whale products by areas:

*Whaling, 1937–38* [1]

OPERATING UNITS: BY AREAS

| Area | Shore stations |  | Factory ships |  | Killer boats |  | Total persons employed |
|---|---|---|---|---|---|---|---|
|  | Number | Persons employed | Number | Crew | Number | Crew |  |
| Alaska | 2 | 129 | ---------- | ---------- | 6 | 69 | 198 |
| Antarctic | ---------- | ---------- | 1 | 215 | 9 | 121 | 336 |
| West Australia | ---------- | ---------- | 2 | 326 | 15 | 198 | 524 |
| California | ---------- | ---------- | 1 | 31 | 2 | 22 | 53 |
| Total | 2 | 129 | [2] 3 | (3) | [2] 28 | (3) | (3) |

[1] Includes the operations of shore stations, factory ships, and killer boats licensed by the United States.
[2] Exclusive of duplication.
[3] Data on total persons employed, exclusive of duplication, not available.

NOTE.—Data on the operations of plants in Alaska and California are for the summer of 1937, while those for West Australia and the Antarctic are for the winter of 1937–38.

## *Whaling, 1937–38*—Continued

### CATCH: By species and areas

| Area | Blue | Humpback | Sperm | Finback | Sei | Right | Total |
|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Alaska | 45 | 104 | 56 | 170 | 1 | | 376 |
| Antarctic | 554 | 47 | | 937 | | 1 | 1,539 |
| West Australia | | 3,242 | 3 | 1 | | | 3,246 |
| California | 8 | 3 | | 14 | 12 | | 37 |
| Total | 607 | 3,396 | 59 | 1,122 | 13 | 1 | 5,198 |

### PRODUCTS MANUFACTURED: By areas

| Area | Oil | Meat | | Meal | |
|---|---|---|---|---|---|
| | | Fresh | Frozen | Meat | Bone |
| | *Barrels* | *Pounds* | *Pounds* | *Tons* | *Tons* |
| Alaska | 15,668 | | | 770 | 435 |
| Antarctic | 111,444 | | | | |
| West Australia | 125,044 | | | | |
| California | 1,010 | 488,500 | 136,400 | | 10 |
| Total | 253,166 | 488,500 | 136,400 | 770 | 445 |

### OPERATING UNITS: Alaska

| Station, factory ship or killer boat | Type of license | Length, feet | Tonnage | | Number men in crew |
|---|---|---|---|---|---|
| | | | Gross | Net | |
| Akutan | Shore station | | | | 70 |
| Kodiak | Killer boat | 100 | 148 | 101 | 11 |
| Unimak | do | 100 | 148 | 101 | 11 |
| Paterson | do | 87.3 | 120 | 81 | 12 |
| Port Hobron | Shore station | | | | 59 |
| Moran | Killer boat | 87.3 | 120 | 77 | 11 |
| Aberdeen | do | 88 | 116 | 59 | 12 |
| Tanginak | do | 97.9 | 151 | 71 | 12 |
| Total | | | 803 | 490 | 198 |

### OPERATING UNITS: Antarctic

| | | | | | |
|---|---|---|---|---|---|
| S. S. Ulysses | Factory ship | 514 | 10,781 | 6,791 | 215 |
| H. J Bull | Killer boat | 151 | 569 | 204 | 16 |
| Kos I | do | 115.7 | 248 | 88 | 13 |
| Kos II | do | 115.7 | 248 | 88 | 13 |
| Kos VI | do | 115.7 | 248 | 88 | 13 |
| Kos VII | do | 115.7 | 248 | 88 | 13 |
| Kos IX | do | 115.1 | 248 | 84 | 13 |
| Kos XI | do | 119.7 | 258 | 93 | 13 |
| Kos XIV | do | 119.7 | 258 | 93 | 13 |
| Kos XXIII | do | 143.5 | 353 | 125 | 14 |
| Total | | | 13,459 | 7,742 | 336 |

## *Whaling, 1937–38*—Continued

### OPERATING UNITS: West Australia

| Station, factory ship or killer boat | Type of license | Length, feet | Tonnage | | Number men in crew |
|---|---|---|---|---|---|
| | | | Gross | Net | |
| S. S. Frango | Factory ship | 400.8 | 6,331 | 3,869 | 116 |
| Thorfinn | Killer boat | 115.7 | 249 | 84 | 13 |
| Hauken | do | 111.9 | 251 | 86 | 13 |
| Femern | do | 116.3 | 257 | 87 | 13 |
| Gvas II | do | 111.9 | 251 | 86 | 13 |
| Pol I | do | 111.8 | 205 | 67 | 13 |
| Pol V | do | 111.2 | 221 | 83 | 13 |
| S. S. Ulysses | Factory ship | 514 | 10,781 | 6,791 | 210 |
| Kos I | Killer boat | 115.7 | 248 | 88 | 13 |
| Kos II | do | 115.7 | 248 | 88 | 13 |
| Kos IX | do | 115.1 | 248 | 84 | 13 |
| Hval I | do | 109.8 | 221 | 77 | 13 |
| Ross I | do | 111.2 | 221 | 83 | 13 |
| A-N I | do | 109.4 | 223 | 76 | 13 |
| A-N IV | do | 110.1 | 223 | 81 | 13 |
| A-N V | do | 116.8 | 246 | 108 | 13 |
| H. J. Bull [4] | do | 151 | 569 | 204 | 16 |
| Total | | | 20,993 | 12,042 | 524 |

### OPERATING UNITS: California

| Station, factory ship or killer boat | Type of license | Length, feet | Gross | Net | Number men in crew |
|---|---|---|---|---|---|
| S. S. California | Factory ship | 194.7 | 953 | 475 | 31 |
| Hawk | Killer boat | 93.2 | 113 | 29 | 11 |
| Port Saunders | do | 92.7 | 112 | 12 | 11 |
| Total | | | 1,178 | 516 | 53 |

### CATCH: Alaska

| Species | Male | Female | Total animals | Males per 100 females | Average size | |
|---|---|---|---|---|---|---|
| | | | | | Male | Female |
| | *Number* | *Number* | *Number* | *Number* | *Feet* | *Feet* |
| Blue | 25 | 20 | 45 | 125 | 76.2 | 77.7 |
| Humpback | 51 | 53 | 104 | 96 | 38.8 | 40.3 |
| Sperm | 56 | | 56 | | 48 | |
| Finback | 95 | 75 | 170 | 127 | 57.8 | 58.5 |
| Sei | | 1 | 1 | | | 48 |
| Total | 227 | 149 | 376 | | | |

### CATCH: Antarctic

| Species | Male | Female | Total animals | Males per 100 females | Male | Female |
|---|---|---|---|---|---|---|
| Blue | 276 | 278 | 554 | 99 | 78.7 | 81.4 |
| Humpback | 20 | 27 | 47 | 74 | 37.9 | 41.5 |
| Finback | 500 | 437 | 937 | 114 | 67.1 | 70.2 |
| Right | [5] 1 | | 1 | | 45 | |
| Total | 797 | 742 | 1,539 | | | |

### CATCH: West Australia

| Species | Male | Female | Total animals | Males per 100 females | Male | Female |
|---|---|---|---|---|---|---|
| Humpback | 2,069 | 1,173 | 3,242 | 176 | 39.3 | 40.2 |
| Sperm | 3 | | 3 | | 46.5 | |
| Finback | 1 | | 1 | | 57 | |
| Total | 2,073 | 1,173 | 3,246 | | | |

[4] Operated in Antarctic after close of season in West Australia.

[5] Taken for scientific purposes.

*Whaling, 1937–38*—Continued

CATCH: CALIFORNIA

| Species | Male | Female | Total animals | Males per 100 females | Average size | |
|---|---|---|---|---|---|---|
| | | | | | Male | Female |
| | *Number* | *Number* | *Number* | *Number* | *Feet* | *Feet* |
| Blue | 2 | 6 | 8 | 33 | 75 | 71.3 |
| Humpback | 1 | 2 | 3 | 50 | 45 | 41.5 |
| Finback | 5 | 9 | 14 | 55 | 56 | 55.7 |
| Sei | 5 | 7 | 12 | 71 | 45 | 47.2 |
| Total | 13 | 24 | 37 | | | |

CATCH: UNDER-SIZED HUMPBACK WHALES [6]

| Whaling area | Male | Female | Total animals | Average size | | Smallest killed | |
|---|---|---|---|---|---|---|---|
| | | | | Male | Female | Male | Female |
| | *Number* | *Number* | *Number* | *Feet* | *Feet* | *Feet* | *Feet* |
| Alaska | 8 | 4 | 12 | 32.6 | 32.2 | 29 | 30 |
| Antarctic | 3 | 1 | 4 | 32.3 | 30 | 30 | 30 |
| West Australia | 53 | 63 | 116 | 30.6 | 31.4 | 25 | 25 |
| Total | 64 | 68 | 132 | | | | |

[6] In addition 7 under-sized finback whales consisting of 4 males, averaging 47.75 feet in length, and 3 females, averaging 47.66 feet in length, were taken in Alaska waters.

## STATISTICAL SURVEY PROCEDURE

In order that those who use the statistical data contained in this and previous reports of the Division of Fishery Industries may be informed as to the source of the figures and methods for their collection, it has been deemed advisable to outline, in considerable detail, the statistical survey procedure followed by the Division. This procedure has been developed over a period of years, and changes in method have been made at times where such changes have appeared to work toward general improvement. While the surveys in the several sections are not made in the same manner, owing to varying facilities and records in different States, an attempt has been made to make the data collected by various methods in the producing areas comparable with respect to the same year as well as over a period of years. Throughout the entire plan it has been the intention to coordinate State and Federal fishery statistical work so that there will be as little duplication of effort as possible. The procedure will be discussed under two main heads—"Sectional surveys" and "Local and special surveys."

### SECTIONAL SURVEYS

Statistical surveys of the fisheries and fishery industries of the various sections of the United States occupy by far the greatest part of the time of the statistical personnel of the Division. It is in the course of these surveys that the statistical and marketing agents visit the individual fishing localities of the various States to collect statistics of the volume of the catch of fish and its value, employment in fishing, quantity of fishing gear, number and classification of fishing and transporting craft, employment in wholesale and manufacturing establishments, and the volume and value of manufactured fishery products and byproducts. The various phases of these surveys are discussed in detail in the sections following.

*History.*—The first comprehensive statistical survey of the fisheries and fishery industries of the United States was made for the year 1880 by George Brown Goode, Assistant Director of the U. S. National Museum, and associates, with the cooperation of the Commissioner of Fisheries and the Superintendent of the Tenth Census. Data for specific fisheries, or restricted sections for years prior to 1880, were also collected in this early survey and recorded in Mr. Goode's reports. The survey for 1880, however, did not include the Mississippi River and tributaries. Periodic general surveys of a limited number of States or limited areas of the United States were made for various of the intervening years between 1880 and 1908 and from 1909 to 1928. In 1908 a survey of the entire United States was made. The next general survey of the entire United States was not made until 1931, although complete data for all sections, excluding the Mississippi River and tributaries, were collected for 1929 and 1930. Complete data on the catch and operating units for all sections, excluding the Mississippi River and its tributaries, were collected for 1932. In the latter survey, however, lack of sufficient funds prohibited collection of data on wholesale and manufacturing firms except those data collected as a part of the canned fishery products and byproducts surveys. Complete general canvasses were made of the Chesapeake and Pacific States for the years from 1933 to 1937, inclusive, the New England and Middle Atlantic States for 1933, 1935, and 1937, and the South Atlantic, Gulf, and Lake States for 1934, 1936, and 1937. Complete data on the catch of the fisheries of the Lake States were also collected for 1933 and 1935.

Following is a summary indicating the years for which statistics were collected on the fisheries and fishery industries in the various sections. Figures for the more recent years are available for free distribution from the Bureau in bulletin form, but figures for the earlier years are available only in the various printed reports of the Bureau. These reports are available for reference in the Bureau's library and at many public libraries.

In the New England States statistics on the catch of the marine fisheries, and those conducted in the coastal rivers and bays of these States, were collected for the years 1880, 1887, 1888, 1889, 1898, 1902, 1905, 1908, 1919, 1924, 1928, 1929, 1930, 1931, 1932, 1933, 1935, and 1937. For most of these years data on operating units and wholesale and manufacturing trade also were collected. In addition to the above, a partial statistical survey was made for the entire section in 1892; a partial survey of the fisheries in Maine, New Hampshire, and Massachusetts for the fiscal year 1897; the lobster fishery for 1900 and 1913; the oyster fishery for 1910; the shad and alewife fisheries for 1896; the menhaden industry for 1912; the fisheries of Massachusetts for 1879; and the fisheries of Connecticut for 1925 and 1926.

Statistics on the catch of the marine fisheries and those conducted in the coastal rivers and bays of the Middle Atlantic States were collected for the years 1880, 1887, 1888, 1889, 1890, 1891, 1897, 1898, 1901, 1904, 1908, 1921, 1926, 1929, 1930, 1931, 1932, 1933, 1935, and 1937. Data on operating units and wholesale and manufacturing trade also were collected for most of these years. In addition to these a statistical survey was made of the coastal fisheries of these States in 1915; catch in all States except New York, in 1892; the shad and alewife fisheries in 1896; the shad fisheries of the Delaware River in

1910; the shad fisheries of the Chesapeake Bay and tributaries in 1909; the menhaden industry in 1912; the lobster fisheries in 1900 and 1913; and the oyster fishery in 1911. The years for which statistics are available on the shad fishery of the Hudson River are given in the section entitled "Shad and alewife fisheries."

In the Chesapeake Bay States statistics on the catch of the marine fisheries and those conducted in coastal rivers and bays of these States were collected for the years 1880, 1887, 1888, 1890, 1891, 1897, 1901, 1904, 1908, 1920, 1925, and for all the years from 1929 to 1937, inclusive. Data on operating units and wholesale and manufacturing trade also were collected for most of these years. In addition to the above, a statistical survey was made of the crab fishery for 1915; the oyster fishery and menhaden industry for 1912; and the shad and alewife fisheries for 1896, 1909, and 1915. The years for which statistics of the shad and alewife fisheries of the Potomac River are available are given in the section entitled "Shad and alewife fisheries."

In the South Atlantic and Gulf States statistics on the catch of the marine fisheries and those conducted in the coastal rivers and bays of these States were collected for the years 1880, 1888, 1889, 1890, 1897, 1902, 1908, 1918, 1923, 1927, 1928, 1929, 1930, 1931, 1932, 1934, 1936, and 1937. Data on operating units and wholesale and manufacturing trade also were collected for most of these years. In addition to the above, a statistical survey was made of the fisheries of these States, excluding Florida and Alabama, for 1887; the shad fishery of the South Atlantic States for 1910; the shad and alewife fisheries of the South Atlantic States for 1896; the sturgeon fishery of Florida for 1900; the menhaden industry of the South Atlantic States for 1912; the shrimp fishery for 1916; the oyster fishery of the South Atlantic States for 1910; and the oyster fishery of the Gulf States for 1911.

In the Pacific Coast States statistics on the catch of the marine fisheries and those conducted in the coastal rivers and bays of these States were collected for the years 1880, 1888, 1892, 1895, 1899, 1904, 1908, 1915, and for all the years from 1922 to 1937, inclusive. These surveys have usually included data on operating units and wholesale and manufacturing trade. In addition to the above, statistics were obtained on the fisheries of California from 1918 to 1921, inclusive, and for the oyster fishery in 1912.

Statistics on the catch of the fisheries of the Great Lakes were collected for the years 1880, 1885, 1890, 1893, 1899, 1903, 1908, and for all the years from 1913 to 1937, inclusive. Statistics of the operating units and of the wholesale and manufacturing trade were collected for most of the years when canvasses were made from 1880 to 1908, and in 1917 and 1922 as well as in most of the years from 1926 to 1937, inclusive. In addition to the above a survey was made of the fisheries of Lake Ontario and of certain fisheries in other lakes for the year 1897.

Statistics of the catch of the fisheries of the Mississippi River and its tributaries were collected for the years 1894, 1899, 1903, 1908, 1922, and 1931. In addition, figures have been obtained of the fisheries of Lakes Pepin and Keokuk for the years 1914 and 1917 and the years from 1927 to 1937, inclusive, and of the fisheries of the Mississippi River between Lakes Pepin and Keokuk for the years 1929 to 1937, inclusive.

Statistics also were collected on the fisheries of certain interior waters, other than the fisheries of the Great Lakes and the Mississippi

River and its tributaries, for the years 1894, 1895, 1900, and 1902.

*Statistical agents.*—The statistics contained in this volume have been collected by a corps of trained statistical and marketing agents which comprises a part of the permanent staff of the Division of Fishery Industries of the Bureau. In the main they are college graduates and were recruited through civil-service examination. While in college, many of the men pursued biological or technical courses, largely in fishery work, which has especially suited them for coping with the many biological and technical aspects encountered in canvassing the fisheries. This training has been especially helpful in identification of the species which, because of the many local names applied to a particular species, causes considerable confusion.

*Period covered.*—In conducting the fishery statistical surveys, agents are dispatched to the districts to be surveyed as early in the calendar year as they can be spared from the tabulation and preparation for publication of their previous season's work. They collect statistics of fishery operations for the year preceding that in which they are working; and, since their field work occupies the greater part of the year, it is usually at least a year from the end of the calendar year for which they are collecting data until the figures are published. Most of the figures are collected for the calendar year. Where there are variations from this general practice, explanatory notes appear in the tables. Prior to 1930, statistics on the catch of oysters in the Atlantic and Gulf States were collected for the oyster season; that is, from September to April, inclusive. Beginning with 1930 and down to the present, they have been collected on the basis of the calendar year.

*Scope.*—The scope of the coastal statistical surveys includes canvasses of the commercial fisheries of the oceans and bays and of the coastal rivers as far inland as commercial fishing is important. This usually coincides with the range of commercial fishing for anadromous species. Statistics of the fisheries of the Mississippi River cover canvasses of the fisheries of the Mississippi River proper as well as all of its tributaries wherein commercial fishing for either fish, crustaceans, or mollusks is prosecuted. Statistics of the fisheries of the Great Lakes cover canvasses of the fisheries prosecuted in the Lakes proper, adjacent bays, and the international lakes of northern Minnesota, as well as rivers which sustain a commercial fishery having outlets into these waters. Surveys for statistics of the wholesale and manufacturing fishery industries cover such plants located in the coastal, river, and lake areas adjacent to the waters mentioned above.

*Methods of collection.*—Several methods for the collection of fishery statistics are employed, each of which has been carefully studied to obtain the best results with the available personnel and funds. In most instances the agents obtain lists of the names of fishing vessels, names or numbers of motorboats, and names of owners of these craft from local customs officials. Also it often is possible to obtain the names of licensed commercial fishermen and occasionally some statistics on the catch from several of the State fishery agencies; from other State, county, or city agencies; or from private organizations.

With such preliminary records as are available for their guidance the agents then visit each fishing community in their field unless their preliminary records are so complete that personal visits in some areas may be eliminated. While it is impossible for the few agents available for this work to interview each fisherman in a given locality, the more important ones are visited, and a sufficient number of those of lesser importance are interviewed to obtain reliable information on their production. In practice virtually all wholesale firms are visited, as well as captains of fishing vessels (those of 5 net tons or over), and also most of the more important inshore fishermen.

In the Great Lakes and Pacific Coast States such exceptional cooperation has been obtained in recent years from the State fishery agencies in the collection of statistics that only fragmentary surveys need be made by the Bureau's agents to obtain the necessary data. Also the State fishery agencies in Maryland and Virginia recently have developed very complete statistical systems which greatly facilitate the Bureau's canvasses in these States.

As regards the fisheries of the Great Lakes and international lakes of northern Minnesota, the Bureau obtains most of the catch statistics and usually the value of the catch direct from the records of the State fishery agency. To obtain data on the number of fishermen, boats, vessels, and gear, the Bureau conducts such personal surveys among the fishermen as may be necessary to supplement the State records.

Bureau agents are stationed at Seattle, Wash., and Terminal Island, Calif., who survey the fisheries of the Pacific Coast States. As a rule they obtain figures on the volume of the catch from the records of the several State fishery agencies. In most cases the value of the catch is derived from dealers' records and sometimes from estimates of prices. In Washington and Oregon the offshore fisheries are surveyed separately by the Bureau's agent to obtain data on the number of operating units, catch, and value of the catch. Statistics of the wholesale fishery industry for this section are obtained largely by personal interviews of the agents.

In the administration of the Alaska fisheries the Bureau obtains sworn statements concerning their activities from those prosecuting the fisheries in this area. These statements are compiled by the Alaska Division of this Bureau.

Statistics of the volume of the catch of fish of the Pacific Coast and Great Lakes States are usually shown in weights as landed, which may be in the round or dressed condition. Statistics on the volume of the catch of fish taken in the remainder of the United States are shown in round weight.

The figures in the tables for shellfish represent the weight of the meats in the case of univalve and bivalve mollusks and gastropods, and the round weight of crustaceans and such mollusks as squid and octopus.

*Shore and vessel fisheries.*—In general, statistics of the shore fisheries, as collected by the agents, include data on the number of casual and regular fishermen; number of motor and other fishing boats and accessory boats; kind and quantity of gear used, and the volume, value, and method of capture of each species caught by boats (for our purpose craft of less than 5 net tons capacity are called "boats") for each locality or group of localities. This method is not followed in some sections where the availability of data collected by the State fishery agencies obviates the necessity of detailed locality surveys.

Statistics of the vessel fisheries include data on the number of the crew, rig of vessels, net tonnage, kind and quantity of gear used, accessory boats carried, and volume, value, and method of capture of each species caught by each vessel (for our purpose craft of 5 net tons' capacity or more are called "vessels"). As in the shore fisheries, the availability of figures collected by State fishery agencies may eliminate the necessity of our agents collecting these data for each vessel.

Statistics on the quantity of gear operated indicate the maximum number of units fished at any one time during the year. Gear carried in reserve for replacement is not enumerated.

All persons engaged in commercial fishing operations are included as fishermen. For our purpose these have been divided into "regular" and "casual" fishermen. Regular fishermen are those who receive more than one-half of their annual income from fishing; and casual fishermen are those whose principal business is something other than fishing, and who receive less than one-half of their annual compensation from fishing.

The catch of fish is credited to the principal port of arrival and departure of the craft rather than its point of ownership, registration, documentation, or its port of landing. This accounts for catches of fish being shown in areas where they are not common, since fishing vessels frequently fish in areas far from their principal fishing port.

*Wholesale and manufacturing trade.*—All persons or firms engaged in the wholesale buying and selling of fishery products or who produce manufactured fishery products are surveyed under this title. Where the business of fishing and wholesaling or manufacturing is combined, that part of the business devoted to either of the latter two phases is included in the wholesale and manufacturing survey and the part devoted to fishing is included in the shore or vessel fisheries. If a wholesale business is conducted with no manufacturing and the business is so small that the full time of one man over the whole year or season is not required, it is then disregarded as a wholesale business. If commodities other than fishery products are handled, the persons engaged, and salaries and wages paid, are prorated; and only that part concerned with fishery products is included. If such a firm required less than the full time of one man over the whole year or season and if it does not manufacture, it is not included in the canvass. Retail firms that manufacture or whose wholesale business exceeds the retail part are included. Persons or firms engaged in the motortrucking of fishery products are included as wholesalers if they are engaged in wholesale buying and selling.

Buyers for a central firm are not canvassed as wholesale dealers unless they ship direct to the firm's customers from the buying point.

Fishermen or fishing concerns, except manufacturers, who do not buy fishery products are not included under this heading except that oyster-shucking firms are included provided shuckers are employed, and irrespective of whether all or part of the oysters used are taken from the firms' privately owned beds.

Manufacturing concerns include those which prepare packaged fishery products; salted, spiced, smoked, dried, or otherwise cured fishery products; canned fishery products; or fishery byproducts.

Fishermen who manufacture are surveyed to obtain the number of persons so employed and the volume and value of the products prepared.

In collecting statistics of manufacturing firms, the agents obtain data on the production for each plant in producing areas of products as marketed by the plant. Such products are usually "final" and in form for consumption; however, the products may be "intermediate" and require further processing before reaching the consumer markets. An outstanding example of an intermediate product is green-salted groundfish, which almost invariably is further processed before final marketing. In reviewing the statistics of manufactured products it should be observed that intermediate products are not shown where they are prepared to the final stage in the original plant. An exception to this rule, however, is in the case of the production of mild-cured salmon, which, on account of its importance, is shown in its entirety, whether further processed in the producing plant or not. In this connection it should also be stated that several of the byproducts for which statistics are shown may be intermediate, and the plants producing the final products are not surveyed by this Bureau. Outstanding among such products are marine-animal oils, scrap, and meal.

Statistics of persons engaged in wholesale and manufacturing establishments are reported in three groups: Proprietors, salaried employees, and wage earners.

Proprietors represent those persons who devote their time to the conduct of the enterprise and receive their compensation in the form of profits. Managers of branch houses are not classified as proprietors.

Salaried employees usually include those persons paid by the week or month, while wage earners usually consist of those paid on a per diem or piece-work basis. This, however, is not true in all cases, since the distinction between these two classes depends primarily on the character of the work done rather than the unit of time employed for calculating rates of pay. In general, office employees are classified as salaried employees. Other employees, including plant workmen, are classed as wage earners. Plant foremen or superintendents are classified as salaried employees unless they are principally engaged in manual labor; in which case they are classified as wage earners. Active officers of corporations are classified as salaried employees. Statistics of wage earners are shown in two forms: The average number employed during the operating season; and the average number employed during the year (the monthly average for the year).

*Transporting trade.*—Statistics are obtained on the number of the crew and number of boats and vessels engaged in transporting fishery products from the fishing grounds to port or from port to port. However, if a craft is engaged in catching fish at any time of the year it is included as a fishing craft rather than as a transporter.

*Publication of data.*—Statistics of employment in the fisheries, craft and gear engaged, catch and value of catch, and certain data on industries related to the fisheries are summarized and published in bulletin form as soon as possible after completion of each survey. Later the figures in more detail are included in the annual reports of the Division.

## LOCAL AND SPECIAL SURVEYS

*Landings at certain important United States ports.*—Statistics of the lands of aquatic products at the principal New England ports (Boston and Gloucester, Mass., and Portland, Maine) are obtained in a similar manner. An agent is permanently stationed at Boston, Mass., and another is assigned to the ports of Gloucester, Mass., and Portland, Maine. Their duties include the obtaining of figures daily on the quantity of fish landed by each fishing vessel, the value of such fish landed, information concerning the date of departure and arrival of the vessel, and they also indicate the grounds from which the fish were taken and gear used in their capture. These data are forwarded to the Bureau, where compilations are made. Products of American fisheries received duty free at Boston and Gloucester, Mass., and Portland, Maine, from the treaty coasts of Newfoundland, Magdalen Islands, and Labrador are included in the landings at these ports; however, they are not included in the catch in sectional fishery surveys of the New England States unless they represent a catch by United States vessels. Statistics of these landings are released monthly and annually in bulletin form and detailed data are published in the annual reports of this Division. Data on the landings at Boston, and Gloucester, Mass., have been collected annually since 1893, and those for Portland, Maine, since June 1915. Some data are available for Boston and Gloucester prior to 1893.

Statistics of the landings of fish at Seattle, Wash., are collected by the Bureau's agent in that city. Landings are classified as those made by United States fishing vessels and those received by Seattle wholesale dealers. The landings credited to United States fishing vessels are made by vessels operating distinctly as primary fishing units, usually in the offshore fisheries, while those credited as received by wholesale dealers are usually products of the shore fisheries collected mainly from points in Puget Sound and do not include fish received from Alaska or Canada, or landings made by the halibut fleet. Statistics of these landings at Seattle are released monthly and annually in bulletin form and detailed data are published in the annual reports of this Division. Statistics of the landings by fishing vessels at Seattle have been collected since June 1915 and certain data on products received by Seattle wholesale dealers since December 1915.

*Atlantic mackerel fishery.*—Statistics on the catch by the Atlantic mackerel fleet are obtained by combining the figures of mackerel landed at Boston and Gloucester, Mass., and Portland, Maine, with those obtained by Bureau agents, who in recent years have been stationed at other Atlantic ports where mackerel are landed. These agents obtain data on the volume of mackerel landed in a manner similar to that used to obtain figures on the landings by fishing vessels at the three New England ports. The figures include only the catches made by purse seine and drift gill net craft and are not complete for craft of under 5 net tons' capacity using this type of gear. Statistics of this fishery appear only in the annual reports of this Division, although the landings at the principal New England ports appear in the monthly and annual bulletins published for those ports. Statistics of this fishery are available from 1905 to 1937, inclusive.

*Shad and alewife fisheries.*—Owing to the importance of the Hudson and Potomac Rivers in the production of shad, surveys for statistics of the catch, value of the catch, and operating units are made annually. On the Potomac River similar statistics also are obtained for the alewife fishery. Much of the data required for these surveys are available from the State fishery agencies.

Statistics of the shad and alewife fisheries are not published separately in bulletin form, but a summary of the year's activities is published in the annual reports of the Division.

Statistics of the shad fishery of the Hudson River are available for 1896, 1897, 1898, 1901, 1904, 1910, and from 1915 to 1937, inclusive, while data for the shad fishery of the Potomac River are available for 1896, 1901, 1904, 1909, 1915, and from 1919 to 1937, inclusive. Statistics of the alewife fishery of the Potomac River are available for 1896, 1909, 1915, and from 1919 to 1937, inclusive.

*Pacific halibut fishery.*—Statistics of the Pacific halibut fishery are obtained by the Bureau's agent in Seattle, aided by Bureau representatives in Alaska and the International Fisheries Commission. The fleet classification has been arbitrarily applied by including in the "Washington fleet" all United States and Alaska vessels that land more than half of their catch in that State. All other United States and Alaska vessels of the halibut fleet are included in the "Alaska fleet." Monthly and annual statistical bulletins are available on this fishery, being published along with the statistics of the landings of fishery products at Seattle, Wash., and detailed statistics are published in the annual reports of the Division. Statistics of the landings of halibut at Pacific coast ports have been collected since 1925.

*Canned fishery products and byproducts.*—Beginning in 1921, the Bureau has made annual surveys for statistics of the canned fishery products and byproducts industries of every section. These are begun the first week in January of each year for statistics of the production in the preceding year. The surveys usually occupy 6 to 9 weeks' time. During this period the Bureau obtains by mail, so far as possible, the production of canned fishery products or byproducts from each plant in the United States engaged in this business. Where it is impossible to obtain reports by mail the report is obtained by personal visit by the Bureau's agents. They obtain statistics of the production and value of the production for each commodity. Statistics of the canned fishery products and byproducts produced in Alaska are received on the same statements obtained by the Bureau that include statistics of general fishery operations.

An annual statistical bulletin is issued on this trade, and detailed statistics of the output are published in the annual reports of the Division. In addition to the data obtained on the output of these products annually since 1921, data also usually were obtained prior to 1921 for the years the various sections were surveyed.

The value shown for canned products constitutes the gross amount received by the packer at the production point, no deductions being made for commission or expenses.

*Packaged-fish trade.*—Complete statistics of the annual production and value of fish packaged in the United States are obtained as a part of the survey for the statistics of the canned fishery products and byproducts industries. These statistics are released in bulletin form annually and detailed statistics are published in the annual reports of the Division. Statistics of the production of packaged fish are available for 1926 and the years from 1928 to 1937, inclusive.

*Cold-storage holdings of fish.*—An arrangement has been made with the Bureau of Agricultural Economics, Department of Agriculture, whereby statistics of the cold-storage holdings of the various species of fish, by sections of the United States are furnished to this Bureau monthly. Included with statistics of the holdings are statements of the quantity of the various species of fish frozen and also the holdings of certain cured fish. Bulletins showing these statistics are issued monthly as well as annually, and detailed statistics are published in the annual reports of this Division. Statistics of cold-storage holdings of fishery products have been published since 1917 and data on quantities of fish frozen, for the years from 1920 to 1925, inclusive, and from 1928 to 1937, inclusive.

*Sponge market, Tarpon Springs.*—A large proportion of the total output of sponges in Florida is handled through the sponge exchange at Tarpon Springs. In view of this, the Bureau has obtained from a representative of the exchange annual statistics of the quantity and value of the sponges, by variety classifications, handled through it annually. Statistics of the quantity of sponges handled through the exchange are not published in bulletin form, but a summary of the year's activities is published in the annual reports of this Division. Statistics of the transactions on the sponge exchange are available for 1913, 1914, and for the years from 1917 to 1937, inclusive.

*Foreign fishery trade.*—Statistics of the foreign fishery trade are obtained from compilations made by the Bureau of Foreign and Domestic Commerce, Department of Commerce. Statistics of all known fishery products imported or exported have been assembled in one table and published annually in the reports of the Division in recent years. For earlier years they are available in the reports of the Bureau of Foreign and Domestic Commerce, the Bureau of Statistics, the Department of Commerce and Labor, or the Treasury Department.

## PRACTICES AND TERMS

Certain practices and terms of importance used in the compilation of fishery statistics are explained below.

*Days absent.*—In computing "days absent" for vessels landing fares at the various ports, the day of departure and the day of arrival are included; thus a vessel leaving port on the 8th of the month and returning on the 15th of the month will be shown as being absent 8 days.

*Operating units.*—Operating units as referred to in this document include persons engaged in the fisheries, and fishing craft and gear employed.

*Vessel.*—The term "vessel" refers to a craft having a capacity of 5 net tons or more.

*Boat.*—The term "boat" refers to a craft having a capacity of less than 5 net tons.

*Incidental catch.*—The term "incidental catch" refers to the catch of certain species by a type of gear which ordinarily does not capture such species.

*Percentages.*—Percentages are usually shown as whole numbers. Fractions of percents are dropped if less than five-tenths, and the percentage is raised to the next higher integer if the fraction is greater than five-tenths. If the fraction is exactly five-tenths, the integer is raised or lowered to make it an even number.

*Converting.*—Many of the figures shown in the statistical tables published herewith have been converted to thousands of pounds or dollars. In making these conversions the largest number from which a group of items is computed is raised or lowered to the nearest thousands place. If the number ends in an even 500, the thousands integer is raised or lowered to make it an even number. The individual items are changed to conform to the total thus obtained.

*Confidential data.*—The statistical data collected by the Division are confidential and are not released except by approval of the Washington office. Statistics of production of wholesale and manufacturing firms are published only for commodities or geographical areas where the production of three or more concerns may be grouped. Every effort is made to publish only those figures which will not reveal individual enterprise.

## CONVERSION FACTORS

It is the policy of the Bureau to show the detailed catch figures of all products in pounds for the sake of uniformity and for purposes of comparison. Following such a policy presents certain problems. In the case of fish there is little difficulty since in very rare instances are such products reported in units of measure other than pounds. For shellfish, however, the units of measure may be bushels, sacks, barrels, or thousands of shellfish, gallons of meats, etc. These many units make standardization difficult, but when coupled with the wide variation in the requirements or definition of some of these units in the various States the problem becomes even more complex.

All bivalve mollusks are reported in pounds of meats in the detailed catch tables presented in this report. In addition, there are included supplementary tables for most of the sections, which give data on the production in bushels. These supplementary tables also give the production of certain other shellfish, such as crabs, in number.

*Oysters.*—Probably the greatest problem in presentation of fishery statistics in uniform units of measure is in the case of oysters. Usually the production of oysters on the Atlantic and Gulf coasts is reported to Bureau agents in bushels; and prior to the data obtained for the year 1930 conversion from bushels to pounds of meats was effected on the basis of a uniform yield of 7 pounds of meats to the bushel. However, more recent investigations have shown considerable variation from this figure. There follows a table which gives the results of these studies of the measures used for oysters in the various States and of the average yields per bushel. This table presents the factors that have been used in the oyster statistics given in this report.

*Measures and yields of oysters*

| State | Capacity of State bushel | Variation from U. S. standard bushel | | Market oysters | |
|---|---|---|---|---|---|
| | | | | Yield per State bushel | Yield per standard bushel |
| | *Cubic inches* | *Cubic inches* | *Percent* | *Pounds of meats* | *Pounds of meats* |
| Massachusetts | 2, 150. 4 | | | 6. 57 | 6. 57 |
| Rhode Island | 2, 150. 4 | | | 7. 05 | 7. 05 |
| Connecticut | 2, 150. 4 | | | 7. 70 | 7. 70 |
| New York | 2, 150. 4 | | | 7. 00 | 7. 00 |
| New Jersey | 2, 257. 3 | +106. 9 | +5. 0 | 6. 05 | 5. 76 |
| Delaware | 2, 257. 3 | +106. 9 | +5. 0 | 7. 00 | 6. 67 |
| Maryland | 2, 801. 5 | +651. 1 | +30. 3 | 5. 98 | 4. 59 |
| Virginia | 3, 003. 4 | +853. 0 | +39. 7 | 6. 06 | 4. 34 |
| North Carolina | 2, 801. 9 | +651. 5 | +30. 3 | 5. 52 | 4. 24 |
| South Carolina | 4, 071. 5 | +1, 921. 1 | +89. 3 | 5. 87 | 3. 10 |
| Georgia | 5, 343. 9 | +3, 193. 5 | +148. 5 | 6. 21 | 2. 50 |
| Florida | 3, 214. 1 | +1, 063. 7 | +49. 4 | 5. 49 | 3. 67 |
| Alabama | 2, 826. 2 | +675. 8 | +31. 4 | 5. 13 | 3. 90 |
| Mississippi | 2, 826. 2 | +675. 8 | +31. 4 | 4. 95 | 3. 78 |
| Louisiana | 2, 148. 4 | −2. 0 | −. 1 | 4. 09 | 4. 09 |
| Texas | 2, 700. 0 | +549. 6 | +25. 6 | 5. 64 | 4. 49 |

*Other mollusks.*—The following table shows the conversion factors for various mollusks, other than oysters, used in this report:

*Average yields of certain mollusks in pounds of meats per State bushel*

| State | Clams, hard | Clams, soft | Clams, surf | Clams, razor | Mussels, sea | Periwinkles and cockles | Scallops, bay | Scallops, sea | Conchs |
|---|---|---|---|---|---|---|---|---|---|
| Maine | 11 | 15 | -------- | -------- | 12 | 18 | 6 | 6 | -------- |
| New Hampshire | -------- | 15 | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Massachusetts | 11.01 | 14.15 | 17 | 30.2 | -------- | 18 | 6.07 | 6 | -------- |
| Rhode Island | 12 | 20 | 12 | -------- | 13 | 18 | 6.19 | 6 | -------- |
| Connecticut | 12.12 | 20 | -------- | -------- | -------- | -------- | 6.2 | -------- | 19.75 |
| New York | 8 | 16 | 12 | -------- | 10 | -------- | 5 | 6 | 18 |
| New Jersey | 8.07 | 20 | 17.8 | -------- | -------- | -------- | -------- | 6 | -------- |
| Delaware | 10 | -------- | -------- | -------- | 12 | -------- | -------- | -------- | -------- |
| Maryland | 8 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Virginia | 8 | -------- | -------- | -------- | 12 | -------- | -------- | 6 | -------- |
| North Carolina | 8 | -------- | -------- | -------- | -------- | -------- | 7.68 | -------- | -------- |
| South Carolina | 8 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Florida | 8 | -------- | -------- | -------- | -------- | -------- | 4.17 | -------- | -------- |

*Other conversion factors.*—The principal other conversion factors that have been used in this report are as follows:

| | |
|---|---|
| Alewives | To convert number of fish to weight in pounds, multiply by 0.4. |
| Cod, large, salted | To convert to fresh-gutted weight, multiply by 1.90. |
| Cod, market, salted | To convert to fresh-gutted weight, multiply by 1.94. |
| Cod, scrod, salted | To convert to fresh-gutted weight, multiply by 1.98. |
| Crustaceans: | |
| Crabs, soft and peelers (Connecticut, Rhode Island, New York, Delaware, Maryland, and Virginia). | To convert number of crabs to weight in pounds, divide by 4. |
| Crabs, soft and peelers (North Carolina). | To convert number of crabs to weight in pounds, divide by 7. |
| Crabs, soft and peelers (Louisiana). | To convert number of crabs to weight in pounds, divide by 2.96. |
| Crabs, soft and peelers (other States). | To convert number of crabs to weight in pounds, divide by 3. |
| Crabs, hard (Maine) | To convert number of crabs to weight in pounds, divide by 3.32. |
| Crabs, hard (Massachusetts) | To convert number of crabs to weight in pounds, divide by 4. |
| Crabs, hard (Connecticut) | To convert number of crabs to weight in pounds, divide by 2.8. |
| Crabs, hard (North Carolina). | To convert number of crabs to weight in pounds, divide by 2.95. |
| Crabs, hard (South Carolina). | To convert number of crabs to weight in pounds, divide by 2. |
| Crabs, hard (Florida) | To convert number of crabs to weight in pounds, divide by 2.08. |
| Crabs, hard (Alabama and Georgia). | To convert number of crabs to weight in pounds, divide by 2.1. |
| Crabs, hard (Mississippi) | To convert number of crabs to weight in pounds, divide by 2.09. |
| Crabs, hard (Louisiana) | To convert number of crabs to weight in pounds, divide by 2.16. |
| Crabs, hard (Texas) | To convert number of crabs to weight in pounds, divide by 1.96. |
| Crabs, hard (other Atlantic Coast States). | To convert number of crabs to weight in pounds, divide by 3. |

| | |
|---|---|
| Crustaceans—Continued | |
| Crabs, rock | To convert number of crabs to weight in pounds, divide by 10. |
| Crabs, stone | To convert number of crabs to weight in pounds, multiply by 1.2. |
| Cusk, salted | To convert to fresh-gutted weight, multiply by 1.90. |
| Haddock, large, salted | To convert to fresh-gutted weight, multiply by 2.06. |
| Haddock, scrod, salted | To convert to fresh-gutted weight, multiply by 2.10. |
| Hake, large, salted | To convert to fresh-gutted weight, multiply by 1.90. |
| Hake, small, salted | To convert to fresh-gutted weight, multiply by 1.98. |
| Halibut, salted | To convert to fresh-gutted weight, multiply by 2. |
| Herring, salted | To convert to round weight, multiply by 1.50. |
| Mackerel, salted | To convert to round weight, multiply by 1.35. |
| Menhaden | To convert number of fish to weight in pounds, multiply by 0.6. |
| Pollock, salted | To convert to fresh-gutted weight, multiply by 1.90. |
| Sponges, dried (Florida): | |
| Large wool | To convert number of bunches to weight in pounds, multiply by 7. |
| Medium and small wool | To convert number of bunches to weight in pounds, multiply by 3. |
| Wool rags | To convert number of bunches to weight in pounds, multiply by 4.5 |
| Grass | To convert number of bunches to weight in pounds, multiply by 1.5. |
| Wire and yellow | To convert number of bunches to weight in pounds, multiply by 2. |

## COMMON AND SCIENTIFIC NAMES OF FISHERY PRODUCTS

In order to prevent misunderstanding in the use of common names employed in the tables and discussions, the following list of common and scientific names is given:

*Common and scientific names of the commercial fishery products caught in the United States and Alaska*

| Common name as shown in Bureau reports | Other common names | Scientific names |
|---|---|---|
| Albacore | (See tuna) | *Germo alalunga.* |
| Alewife | Branch herring, wall-eyed or big-eyed herring. | *Pomolobus pseudoharengus.* |
| | Blueback, glut herring | *Pomolobus æstivalis.* |
| Amberjack | | Seriola species. |
| Anchovy | | *Engraulis mordax.*<br>*Anchoviella delicatissima.*<br>*Anchoviella compressa.* |
| Angelfish | | *Pomacanthus arcuatus.*<br>*Holacanthus isabelita.* |
| Barracuda | | *Sphyraena argentea.* |
| Black bass | Smallmouth bass | *Micropterus dolomieu.* |
| | Largemouth bass | *Micropterus salmoides.* |
| Bluefish | Tailor | *Pomatomus saltatrix.* |
| Blue pike | Pike perch, blue pickerel (Canada) | *Stizostedion glaucum.* |
| Blue runner or hardtail | Runner | *Caranx crysos.* |
| Bonito | | *Sarda sarda.*<br>*Sarda chiliensis.* |
| Bowfin | | *Amia calva.* |
| Buffalofish | | Ictiobus species. |
| Butterfish | | *Poronotus triacanthus.* |
| Burbot | Lawyer, ling | *Lota maculosa.* |
| Cabio | Coalfish, crab eater, cobia | *Rachycentron canadus.* |
| Cabrilla | Rock bass | *Epinephelus analogus* (Pacific coast). |

*Common and scientific names of the commercial fishery products caught in the United States and Alaska*—Continued

| Common name as shown in Bureau reports | Other common names | Scientific names |
|---|---|---|
| Carp | German carp | *Cyprinus carpio.* |
| Catfish and bullheads | | Ameiurus species.<br>Ictalurus species.<br>*Leptops olivaris.* |
| Cero | Painted mackerel | *Scomberomorus regalis.* |
| Chub | Tullibee in Canada; longjaw, bluefin, blackfin in United States. | All *Leuchichthys* except *artedi* (in Great Lakes). |
| Cigarfish | Scad | *Decapterus punctatus.* |
| Cisco | Herring in Canada | *Leucichthys artedi* (Lake Erie only). |
| Cod | Codfish | *Gadus macrocephalus* (Pacific coast).<br>*Gadus callarias* (Atlantic coast). |
| Crappie | White crappie | *Pomoxis annularis.* |
| | Black crappie, strawberry bass, calico bass. | *Pomoxis sparoides.* |
| Crevalle | | *Caranx hippos.* |
| Croaker | Crocus, hardhead | *Micropogon undulatus.* |
| Cunner | Chogset, blue perch, bergall | *Tautogolabrus adspersus.* |
| Cusk | | *Brosme brosme.* |
| Dolly Varden trout | Salmon trout, bull trout | *Salvelinus parkei.* |
| Dolphin | | *Coryphaena hippurus.* |
| Drum: | | |
| Black | | *Pogonias cromis.* |
| Red | Channel bass, redfish, spotted bass | *Sciaenops ocellatus.* |
| Eel: | | |
| Common | | *Anguilla rostrata.* |
| Conger | | *Leptocephalus conger.* |
| Flounder: | | |
| Gray sole | | *Glyptocephalus cynoglossus.* |
| Lemon sole | | *Pseudopleuronectes dignabilis.* |
| Yellowtail and dab | | *Limanda ferruginea.*<br>*Hippoglossoides platessoides.* |
| Blackback | | *Pseudopleuronectes americanus.* |
| Fluke | | *Paralichthys dentatus.* |
| "Sole" | | Pleuronectidae species (Pacific coast). |
| California halibut | | *Paralichthys californicus.* |
| Unclassified | | Pleuronectidae species. |
| Flyingfish | | *Cypsilurus californicus.* |
| Frigate mackerel | "Boo Hoo" | *Auxis thazard.* |
| Garfish | | Tylosurus species. |
| Gizzard shad | Nanny shad, mud shad | *Dorosoma cepedianum.* |
| Goldfish | Sand perch | *Carassius auratus.* |
| Goosefish | Allmouth | *Lophius piscatorius.* |
| Grayfish | Dogfish | *Squalus sucklii* (Pacific coast). |
| | Spiny dog | *Squalus acanthias.* |
| | Smooth dog | *Mustelus mustelus.* |
| Grouper | "Sea bass" | Ephinephelus species.<br>Myceteroperca species. |
| Grunt | Margatefish, sailors choice (Key West) | Haemulon species. |
| Haddock | | *Melanogrammus aeglefinus.* |
| Hake | Squirrel hake, Boston hake, ling, black hake, mud hake. | Urophycis species (Atlantic coast). |
| | Merluccio | *Merluccius productus* (Pacific coast). |
| Halibut | | *Hippoglossus hippoglossus.* |
| Hardhead | | *Orthodon microlepidotus* (Pacific coast). |
| Harvestfish | Starfish, dollarfish, pappyfish, butterfish (N. C.). | *Peprilus alepidotus.* |
| Herring: | | |
| Lake | Herring | *Leucichthys artedi* (Great Lakes, except Erie). |
| Round | | *Etrumeus sadina.* |
| Sea | | *Clupea harengus* (Atlantic coast).<br>*Clupea pallasii* (Pacific coast). |
| Herring smelt | Sea smelt | *Argentina silus.* |
| Hickory shad | Tailor shad, skip | *Pomolobus mediocris.* |
| Hogchoker | | *Achirus fasciatus.* |
| Hogfish | Capitaine, perro perro | *Lachnolaimus maximus* (Florida). |
| Horse mackerel | Pacific | *Trachurus symmetricus.* |
| | Atlantic—(See tuna.) | |
| Jewfish | | *Promicrops itaiara.* |
| Kingfish | King mackerel, cerro | *Scomberomorus cavalla* (Atlantic coast).<br>*Scomberomorus regalis* (Atlantic coast). |
| | Little roncador, croaker | *Genyonemus lineatus* (California). |
| King whiting | Northern whiting, kingfish, sea mink | Menticirrhus species. |
| Lake trout | | *Cristivomer mamaycush.* |
| Lamprey | | *Petromyzon marinus.* |
| Launce | Sand eel, lant, sand launce | *Ammodytes americanus.* |
| "Lingcod" | Cultus cod, blue cod, buffalo cod, ling | *Ophiodon elongatus.* |
| Mackerel | | *Scomber scombrus* (Atlantic coast).<br>*Scomber diego* (Pacific coast). |

*Common and scientific names of the commercial fishery products caught in the United States and Alaska*—Continued

| Common name as shown in Bureau reports | Other common names | Scientific names |
|---|---|---|
| Marlin | Spearfish | *Tetrapturus mitsukurii* (Pacific coast). |
| Menhaden | Mossbunker, pogy, fatback | *Brevoortia tyrannus.* |
| Minnow | | Cyprinidae species. |
| Mojarra | | Gerridae species. |
| Mooneye | Toothed herring | Hiodon species. |
| Moonfish | | *Vomer setipinnis.* |
| | | *Selene vomer.* |
| Mullet | Jumping mullet | Mugil species. |
| Mummichog | Mayfish, killifish | Fundulus species. |
| Muttonfish | | *Lutianus analis.* |
| Paddlefish | Spoonbill cat | *Polyodon spathula.* |
| Perch (California) | See surffishes. | |
| Permit | See pompano. | |
| Pigfish | Hogfish (N. C.) | *Orthopristis chrysopterus.* |
| Pike or pickerel | Great Lakes pike | *Esox reticulatus.* |
| | | *Esox lucius.* |
| Pilchard | Sardine | *Sardina caerulea.* |
| Pilotfish | | *Naucrates ductor.* |
| | | Seriola species. |
| Pinfish | Bream, salt-water bream | *Lagodon rhomboides.* |
| Pollock | | *Pollachius virens.* |
| Pompano | Permit, great pompano | *Trachinotus goodei.* |
| | | Trachinotus species (Atlantic coast). |
| | | *Palometa simillima* (Pacific coast). |
| Porgy | Porgee | Calamus species. |
| Porkfish | Sisi | *Anisotremus virginicus.* |
| Quillback | Spearfish or skimfish | Carpiodes species. |
| Roach | Golden Shiner | *Notemigonus crysoleucas.* |
| Rock bass | Redeye, goggle-eye | *Ambloplites rupestris* (Mississippi River to Atlantic seaboard). |
| | Groupers | *Paralabrax nebulifer* (Pacific coast). |
| Rockfish | Rock cod | Sebestodes species (Pacific coast). |
| Rosefish | | *Sebastes marinus.* |
| Rudderfish | Blue bass, greenfish | *Girella nigricans* (Pacific coast). |
| | Halfmoon | *Medialuna californiensis* (Pacific coast). |
| Sablefish | Black cod | *Anoplopoma fimbria.* |
| Salmon: | | |
| Atlantic | | *Salmo salar* (Atlantic coast). |
| Pacific: | | |
| Blueback, red or sockeye. | | *Oncorhynchus nerka.* |
| Chinook or king | Tyee, spring | *Oncorhynchus tschawytscha.* |
| Chum or keta | Dog salmon | *Oncorhynchus keta.* |
| Humpback or pink. | | *Oncorhynchus gorbuscha.* |
| Silver or coho | | *Oncorhynchus kisutch.* |
| Steelhead | (See steelhead trout.) | |
| Sauger | Sand pike | *Stizostedion canadense.* |
| Sculpin | | Cottidae species. |
| Scup | Paugy or porgy, fair maid | Stenotomus species. |
| Sea bass | Black jewfish or black sea bass | *Stereolepis gigas* (Pacific coast). |
| | Black sea bass, blackfish | *Centropristes striatus* (Atlantic coast). |
| | White sea bass | *Cynoscion nobilis* (Pacific coast). |
| Sea catfish | Gafftopsail | *Bagre marina.* |
| Sea robin | | Prionotus species. |
| Shad | American shad | *Alosa sapidissima.* |
| Shark | | Carcharodon species: Mustelus species; Carcharhinus species: Sphyrna species. |
| Sheepshead | | *Archosargus probatocephalus* (Atlantic coast). |
| | | *Archosargus unimaculatus* (Florida). |
| | Drum, fresh water | *Aplodinotus grunniens* (fresh water). |
| Sheepshead, California | Redfish, fathead | *Pimelometopon pulcher.* |
| Silver perch | Sand perch | *Bairdiella chrysura.* |
| Silverside | Spearing | Menidia species. |
| Skate | | Raja species. |
| Skipper | Billfish | *Scomberesox saurus.* |
| Smelt | | *Osmerus mordax* (Atlantic coast). |
| | | Argentinidae species (Pacific coast). |
| | Eulachon | *Thaleichthys pacificus.* |
| Snapper: | | |
| Mangrove | Gray snapper | *Lutianus griseus.* |
| Red | | *Lutianus blackfordii.* |
| Snook | Robalo, sergeantfish | *Centropomus undecimalis.* |
| Spadefish | Porgy (N. C.) | *Chætodipterus faber.* |
| Spanish mackerel | | *Scomberomorus maculatus.* |
| Splittail | | *Pogonichthys macrolepidotus.* |
| Spot | Lafayette, goody | *Leiostomus xanthurus.* |
| Squawfish | Sacramento pike | *Ptychocheilus grandis.* |

*Common and scientific names of the commercial fishery products caught in the United States and Alaska*—Continued

| Common name as shown in Bureau reports | Other common names | Scientific names |
|---|---|---|
| Squeteague: | | |
| Gray | Gray trout, weakfish, trout | *Cynoscion regalis.* |
| Spotted | Spotted weakfish, spotted trout | *Cynoscion nebulosus.* |
| White | Sand trout | *Cynoscion arenarius.* |
| Squirrel hake | (See hake.) | |
| Steelhead trout | Salmon trout | *Salmo gairdnerii.* |
| Striped bass | Rockfish, rock | *Roccus saxatilis.* |
| Sturgeon | | Acipenser species. |
| Sturgeon, shovelnose | | *Scaphirhynchus platorynchus.* |
| Sucker | Fresh-water mullet | Catostomidae species. |
| Sunfish | Bream, perch | Centrarchidae species. |
| Surffish | Perch | Embiotocidae species. |
| Swellfish | Puffer, swell toad, balloonfish, globefish. | *Spheroides maculatus.* |
| Swordfish | | *Xiphias gladius.* |
| Tautog | Blackfish, oysterfish | *Tautoga onitis.* |
| Tenpounder | Elops, big-eyed herring | *Elops saurus.* |
| Thimble-eyed mackerel | Bullseye | *Scomber colias.* |
| Tilefish | | *Lopholatilus chamæleonticeps.* |
| Tomcod | | *Microgadus tomcod* (Atlantic coast).<br>*Microgadus proximus* (Pacific coast). |
| Tripletail | | *Lobotes surniamensis.* |
| Tullibee | (See chub.) | |
| Tuna and tunalike fishes: | | |
| Albacore | Longfin tuna | *Germo alalunga.* |
| Bluefin | Tuna | *Thunnus saliens.*<br>*Thunnus thynnus.*<br>*Thunnus secundodorsalis.* |
| Bonito | | *Sarda sarda* (Atlantic coast).<br>*Sarda chiliensis* (Pacific coast). |
| Skipjack | Striped tuna | *Euthynnus pelayms.* |
| Yellowfin | | *Neothunnus macropterus.* |
| Turbot | Greenland halibut<br>American turbot, triggerfish | *Reinhardtius hippoglossoides* (off New England.)<br>*Balistes carolinensis* (off Florida). |
| Wahoo | | *Acanthocybium solandri.* |
| White bass | White lake bass | *Roccus chrysops* |
| Whitebait | Small fry of several species. | |
| Whitefish: | | |
| Common | | *Coregonus clupeiformis* (Great Lakes).<br>*Caulolatilus princeps* (Pacific coast). |
| Menominee | | *Prosopium quadrilaterale.* |
| White perch | | *Morone americana* (Atlantic coast). |
| Whiting | Silver hake | *Merluccius bilinearis.* |
| Wolffish | | *Anarhichas lupus.* |
| Yellow perch | | *Perca flavescens.* |
| Yellow pike | Wall-eyed pike, pike perch, dore | *Stizostedion vitreum.* |
| Yellowtail | | *Ocyurus chrysurus* (Atlantic coast).<br>*Seriola dorsalis* (Pacific coast). |
| Crab: | | |
| Hard | Hard-shell crab, blue crab<br>Dungeness crab<br>Rock crab, hard crab | *Callinectes sapidus.*<br>*Cancer magister* (Pacific coast).<br>*Cancer irroratus* (Atlantic coast). |
| Soft and peelers | Soft-shelled crab, blue crab | *Callinectes sapidus.* |
| King | | *Paralithodes camtschatica* (Pacific coast). |
| King or horsehoe | | *Limulus* (Atlantic coast). |
| Rock | | *Cancer irroratus.* |
| Stone | | *Menippi mercenaria.* |
| Crawfish: | | |
| Fresh water | Crayfish | Cambarus species (Atlantic coast).<br>Astacus species (Pacific coast). |
| Sea | Rock lobster, crayfish | *Panulirus argus* (Atlantic coast).<br>*Panulirus interruptus* (Pacific coast). |
| Lobster: | | |
| Common | | *Homarus americanus* (Atlantic coast). |
| Spiny | (See sea crawfish.) | |
| Shrimp | | *Peneus setiferus.*<br>*Peneus brasiliensis* (Atlantic and Gulf coasts).<br>Pandalus species (Pacific coast).<br>Pandalopsis species (Pacific coast).<br>Crangon species (Pacific coast). |
| Abalone | | Halotis species. |

*Common and scientific names of the commercial fishery products caught in the United States and Alaska*—Continued

| Common name as shown in Bureau reports | Other common names | Scientific names |
|---|---|---|
| Clam: | | |
| Cockle | | *Cardium corbis* (Pacific coast). |
| Hard | Butter<br>Round clam, cherrystone, quahog, little neck. | *Saxidomus nuttall.*<br>*Tirela stultorum* (Pacific coast).<br>*Venus mercenaria* (Atlantic coast).<br>*Venus mortoni* (Florida coast). |
| Pismo | | *Tivela stultorum* (Pacific coast). |
| Razor | | Ensis species (Atlantic coast).<br>*Siliqua patula* (Pacific coast). |
| Soft | Soft shell clam, sand clam, nannynose, maninose. | *Mya arenaria.* |
| Surf | Skimmer | *Mactra solidissimo.* |
| Cockle | Moonshell | *Natica heros* (Atlantic coast). |
| Conch | | Strombus species.<br>Busycon species. |
| Coquina | Pompano shells | *Donax variabilis.* |
| Mussel: | | |
| Sea | | *Mytilus californianus* (Pacific coast).<br>*Mytilus edulis.* |
| Fresh water | | Quadrula species.<br>Lampsilis species.<br>Unio species.<br>Symphynota species. |
| Octopus | | *Octopus punctatus* (Pacific coast). |
| Oyster: | | |
| Eastern | | *Ostrea virginica.* |
| Western | Olympia | *Ostrea lurida* (Pacific coast). |
| Japanese (introduced). | Pacific | *Ostrea gigas.* |
| Periwinkle | | Littorina species. |
| Scallop: | | |
| Bay | | *Pecten irradians* (Atlantic coast).<br>*Pecten aequisulcatus* (Pacific coast). |
| Sea | | *Pecten magellanicus.* |
| Squid | | *Loligo opalescens* (Pacific coast).<br>*Loligo pealei* (Atlantic coast). |
| Sea urchin | | Echinoidae class. |
| Starfish | | Asteroidae class. |
| Terrapin | Diamond-back terrapin | Malaclemmys species. |
| Turtle: | | |
| Green | | *Chelonia mydas.* |
| Loggerhead | | *Thalassochelys caretta.* |
| Hawksbill | | *Chelonia inbricata.* |
| Snapping | Hard shell, alligator turtle | *Chelydra serpentina.*<br>*Macrochelys lacertina.* |
| Soft shell | | Trionyx species. |
| Frog | | Rana species. |
| Irish moss | | *Chrondrus crispus.* |
| Kelp | | Macrocystis species; Nerocystis species; Pelagophycus species; Alaria species. |
| Bloodworm | | *Glycera dibranchiata.* |
| Sandworm | | *Nereis virens.* |
| Sponge: | | |
| Glove | | *Spongia graminea* (Hyatt) *Euspongia officianalis* (L.). |
| Grass | | *Hippospongia equina cerebriformis.* |
| Sheepswool | | *Hippospongia canaliculata gossypina.* |
| Yellow | | *Hippospongia equina elastica.* |
| Trepang | Sea cucumber | *Cucumaris frondosa.*<br>*Thyone briareus.* |

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U. S. DEPARTMENT OF COMMERCE
HARRY L. HOPKINS, Secretary
BUREAU OF FISHERIES
CHARLES E. JACKSON, Acting Commissioner

Administrative Report No. 38

# PROPAGATION AND DISTRIBUTION OF FOOD FISHES

## FISCAL YEAR 1939

By GLEN C. LEACH, M. C. JAMES
and E. J. DOUGLASS

APPENDIX IV TO REPORT OF COMMISSIONER OF FISHERIES
FOR THE FISCAL YEAR 1939

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## ADMINISTRATIVE REPORT SERIES

Since the advent of the Administrative Report Series, considerable confusion has arisen concerning its system of numbering the separates composing it. Inasmuch as the Reports of the Divisions vary in order from year to year, many have found their designations as "Appendix No. I, II, III, or IV" very confusing. To relieve this, it has been decided to number them as "Administrative Report No.—." Inasmuch as 20 separates had already been printed in this series before starting the numbers, it was deemed advisable to begin the numbering with Administrative Report No. 21. Of course, numbers cannot be printed on those already off the press, but for the information of those who wish to know what the first 20 were, they are numbered for filing purposes as follows:

No. 1. Report, Commissioner of Fisheries, 1931.
No. 2. Alaska Fishery and Fur-Seal Industries, 1930.
No. 3. Fishery Industries of the United States, 1930.
No. 4. Progress in Biological Inquiries, 1930.
No. 5. Propagation and Distribution of Food Fishes, 1931.
No. 6. Report, Commissioner of Fisheries, 1932.
No. 7. Alaska Fishery and Fur-Seal Industries, 1931.
No. 8. Fishery Industries of the United States, 1931.
No. 9. Progress in Biological Inquiries, 1931.
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No. 11. Alaska Fishery and Fur-Seal Industries, 1932.
No. 12. Progress in Biological Inquiries, 1932.
No. 13. Fishery Industries of the United States, 1932.
No. 14. Propagation and Distribution of Food Fishes, 1933.
No. 15. Fishery Industries of the United States, 1933.
No. 16. Alaska Fishery and Fur-Seal Industries, 1933.
No. 17. Progress in Biological Inquiries, 1933.
No. 18. Propagation and Distribution of Food Fishes, 1934.
No. 19. Alaska Fishery and Fur-Seal Industries, 1934.
No. 20. Fishery Industries of the United States, 1934.

Note that the last Commissioner's Report was for 1932. Since then its place has been taken by a reprint from the Report of the Secretary of Commerce under the title "Bureau of Fisheries." Inasmuch as it is no longer a Bureau publication, it is not numbered; but it will be supplied to any who request the Report of the Commissioner for any year since 1932.

# PROPAGATION AND DISTRIBUTION OF FOOD FISHES, FISCAL YEAR 1939[1]

By Glenn C. Leach, *Chief*, M. C. James, *Assistant Chief*, and E. J. Douglass, *Superintendent of Distribution, Division of Fish Culture*

## CONTENTS

| | Page |
|---|---|
| Introduction | 555 |
| Species propagated | 556 |
| Production | 558 |
| Construction activities | 559 |
| Cooperation with other conservation agencies | 561 |
| Assignments of fish and fish eggs to States, Territories, and foreign countries | 563 |
| Transfer of eggs between stations | 567 |
| Station output | 568 |
| Egg collections | 575 |
| Notes on operations | 575 |
| Commercial species | 575 |
| Marine species | 577 |
| Great Lakes species | 578 |
| Anadromous species, Atlantic coast | 579 |
| Game-fish propagation | 580 |
| Rocky Mountain territory | 580 |
| New England trout stations | 584 |
| Combination trout and pondfish stations | 585 |
| Appalachian and Blue Ridge trout stations | 588 |
| Pondfish stations | 589 |
| Upper Mississippi Wildlife and Fish Refuge | 593 |
| Aquarium | 594 |
| Distribution operations | 595 |
| Summary, by States, of the distribution of fish, fiscal year 1939 | 596 |

## INTRODUCTION

In announcing the gross production of 8,024,540,685 fish and eggs at Federal fish hatcheries during the fiscal year 1939, the Bureau recognizes that the significance of such a contribution is obscured without further analysis in the form of a report of hatchery production in terms of pounds of fish. However, no such treatment can be followed in handling the billions of fry and eggs of commercial marine species, but it is expected to place in operation during the fiscal year 1940 a system of weighing all the game fish distributed. Again, the production of a few hundred thousand fry or fingerlings of a species which is subject to intense fishing pressure, such as certain species of Pacific salmon, is of greater importance than the distribution of millions of fish of lesser economic value, such as the yellow perch.

It may well be asked why these figures are not reversed and maximum production maintained with the varieties which exhibit the greatest need for restorative measures. This question can be answered by pointing out that, broadly speaking, artificial propagation must be geared to the egg supply, and a depleted species is its own limiting factor upon the scope of artificial replenishment measures.

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[1] Administrative Report No. 38, Appendix IV to the Report of the U. S. Commissioner of Fisheries for the fiscal year 1939. Approved for publication April 23, 1940.

Fish-cultural technology extends from the production of an entirely "synthetic" fish, such as game trout, to a process of byproduct recovery as exemplified in the propagation of shad. A brook trout may be hatched from an egg obtained from a domesticated brood stock held at a private commercial hatchery and may be reared to a size permitting its capture by the angler immediately after its release from the hatchery. This is a synthetic but definite increment of a recreational resource.

On the other hand, migrating shad, when caught for market, may be carrying over 30,000 mature eggs which can be incubated in a hatchery and released as fry. The survival ratio of these fry cannot now be accurately determined, but it is known that without the intervention of the hatchery, the reproductive contribution of the parent fish would be zero.

Hatcheries have failed to stem the depletion of certain species, such as the whitefish, but their role as an elemental factor in conserving the majority of the food and game species is widely conceded. The administration of this activity requires attention to the methods and technique of hatching, rearing, feeding, and transporting fish; to the maintenance and upkeep of the physical plant and equipment; and to the construction of new facilities. The year under review has shown tangible progress in all these aspects. While it has been possible to continue the services rendered to the general public by the stocking of public waters, much of the increased production attained in recent years has been diverted to maintaining the stock of fish in areas under direct Federal ownership or control.

Complete transition to this type of activity is not anticipated, however, as long as the present unbalanced ratio between fishing demand and fish populations in State waters exists. The succeeding tabulations and comments are presented with the purpose of clarifying the significance of the various types of fish-cultural functions carried on by the Bureau.

## SPECIES PROPAGATED

During 1939 there were handled at the hatcheries and rescue stations 47 species, the majority of which are fresh-water types. No attempt has been made to propagate a dozen or more important food fishes which are found in the coastal waters. No practicable methods for propagating certain of these forms have been developed, and there is further doubt as to whether results would be sufficiently valuable to warrant the effort.

In addition to the varieties listed in the table, there are propagated forage fishes comprising some half dozen species of minnows and shiners. These are utilized as food for bass, etc., at the hatcheries and are not available for general distribution or listed in the production records.

No carp, humpback salmon, or Atlantic salmon were handled during the year although these forms were propagated previously. The carp were dropped because of the desire to devote available funds to the propagation of more valuable forms. The "off year" for humpback salmon made it impracticable to obtain eggs of this species and no Atlantic salmon eggs were available from any source.

Kentucky, or spotted bass were distributed for the first time, and the hatching of mackerel was resumed on a limited scale.

The hatchery records reveal interesting facts regarding the popularity of different game species. There appears to be no "All-American" fish, but the largemouth bass most closely approaches this classification. The popularity of the trouts is sectional, with the species native to the different regions rated highest in popularity in their respective sections. The smallmouth bass is highly popular although somewhat restricted in range and has, in the past, presented a production problem which is being rapidly overcome.

The commercial species which have been distributed are those which are most amenable to artificial propagation and are not necessarily those which are of the highest economic value.

- Catfishes (*Siluridae*):
  - Catfish (*Leptops olivaris*).
  - Spotted channel catfish (*Ictalurus punctatus*).
  - Bullhead (*Ameiurus nebulosus*).
- Buffalofish (*Catostomidae*): Common buffaloes ((*Ictiobus* sp.).
- Shad and herring (*Clupeidae*):
  - Shad (*Alosa sapidissima*).
  - Glut herring (*Pomolobus aestivalis*).
- Whitefishes and Lake herring (*Coregonidae*):
  - Common whitefish (*Coregonus clupeaformis*).
  - Lake herring, cisco (*Leucicthys* sp.).
- Salmons and trouts (*Salmonidae*):
  - Chinook, king, or quinnat salmon (*Oncorhynchus tschawytscha*).
  - Chum salmon (*Oncorhynchus keta*).
  - Coho salmon, silver salmon (*Oncorhynchus kisutch*).
  - Red Salmon, sockeye, or blueback salmon (*Oncorhynchus nerka*).
  - Landlocked sockeye salmon, silver trout (*Oncorhynchus kennerlyi*).
  - Steelhead trout (*Salmo gairdnerii*).
  - Landlocked salmon (*Salmo sebago*).
  - Rainbow trout (*Salmo irideus*).
  - Black-spotted trout, cut-throat trout (*Salmo clarki*).
  - Brown or Loch Leven trout (*Salmo fario* var.).
  - Lake trout, mackinaw trout (*Cristivomer namaycush*).
  - Brook trout (*Salvelinus fontinalis*).
  - Golden trout (*Salmo agua-bonita*).
- Grayling (*Thymallidae*): Montana grayling (*Thymallus montanus*).
- Pikes (*Esocidae*): Pike and pickerel (*Esox* sp.).
- Sunfishes (*Centrarchidae*):
  - Crappie (*Pomoxis annularis* and *P. Sparoides*).
  - Largemouth blackbass (*Micropterus salmoides*).
  - Smallmouth black bass (*Micropterus dolomieu*).
  - Kentucky bass (*Micropterus pseudoplites*).
  - Rock bass (*Ambloplites rupestris*).
  - Warmouth bass (*Chaenobryttus gulosus*).
  - Bluegill sunfish (*Lepomis incisor*).
  - Green sunfish (*Lepomis cyanellus*).
  - Redbreasted bream (*Lepomis auritus*).
  - Red-eared sunfish (*Lepomis heros*).
  - Common sunfish (*Lepomis gibbosus*).
- Mojarras de rio (*Cichlidae*):
  - Rio Grande perch (*Herichthys cyanoguttatus*).
- Perches (*Percidae*):
  - Pike Perch (*Stizostedion vitreum*).
  - Yellow perch, ringed perch (*Perca flavescens*).
- White basses (*Serranidae*):
  - White bass (*Roccus chrysops*).
  - Striped bass (*Roccus saxatilis*).
  - White perch (*Morone americana*).

Cods (*Gadidae*):
  Cod (*Gadus callarias*).
  Haddock (*Melanogrammus aeglefinus*).
  Pollock (*Pollachius virens*).
Mackerel (*Scombridae*): Common mackerel (*Scomber scombrus*).
Flounders (*Pleuronectidae*): Winter flounder (*Pseudopleuronectes americanus*).
Lobster (*Homaridae*): Lobster (*Homarus americanus*).

*Summary, by species, of the output of fish and fish eggs during the fiscal year ending June 30, 1939*

| Species | Eggs | Fry | Fingerlings | Total |
|---|---|---|---|---|
| Catfish |  | 10, 000 | 417, 865 | 427, 865 |
| Buffalofish | 78, 681, 500 |  | 800 | 78, 682, 300 |
| Shad |  | 39, 323, 220 |  | 39, 323, 220 |
| Whitefish | 32, 960, 000 | 920, 000 |  | 33, 880, 000 |
| Lake herring |  | 3, 000, 000 |  | 3, 000, 000 |
| Striped bass |  | 1, 797, 950 |  | 1, 797, 950 |
| Chinook salmon | 5, 607, 200 | 21, 812, 610 | 26, 469, 400 | 53, 889, 210 |
| Chum salmon | 1, 369, 000 | 7, 594, 900 | 375, 250 | 9, 339, 150 |
| Silver salmon |  |  | 716, 675 | 716, 675 |
| Sockeye salmon | 75, 000 |  | 2, 343, 505 | 2, 418, 505 |
| Sockeye salmon, landlocked | 122, 960 |  | 444, 155 | 567, 115 |
| Steelhead trout | 35, 000 |  | 935, 255 | 970, 255 |
| Landlocked salmon |  |  | 5, 990 | 5, 990 |
| Rainbow trout | 4, 329, 850 | 238, 140 | 10, 402, 915 | 14, 970, 905 |
| Blackspotted trout | 26, 362, 290 | 2, 328, 440 | 11, 436, 040 | 40, 126, 770 |
| Loch Leven trout | 77, 490 |  | 1, 421, 035 | 1, 498, 525 |
| Lake trout | 276, 280 | 1, 636, 750 | 103, 670 | 2, 016, 700 |
| Brook trout | 5.000 | 1, 410, 500 | 10, 308, 065 | 11, 723, 565 |
| Golden trout | 6, 100 |  | 71, 040 | 77, 140 |
| Grayling | 1, 799, 800 | 4, 496, 750 | 258, 050 | 6, 554, 600 |
| Pike and pickerel | 1, 643, 150 |  |  | 1, 643, 150 |
| Crappie |  |  | 430, 745 | 430, 745 |
| Black bass, largemouth |  | 3, 787, 650 | 8, 668, 965 | 12, 456, 615 |
| smallmouth |  | 1, 400, 500 | 325, 360 | 1, 725, 860 |
| Kentucky bass |  | 7, 000 | 3, 350 | 10, 350 |
| Rock bass |  |  | 121, 960 | 121, 960 |
| Warmouth bass |  |  | 91, 415 | 91, 415 |
| Sunfish |  |  | 8, 788, 400 | 8, 788, 400 |
| Rio Grande perch |  |  | 175, 760 | 175, 760 |
| Pike perch | 4, 271, 950 | 330, 490, 000 |  | 334, 761, 950 |
| White perch |  | 4, 300, 000 | 260 | 4, 300, 260 |
| Yellow perch |  | 300, 666, 000 | 17, 030 | 300, 683, 030 |
| Mackerel |  | 11, 060, 000 |  | 11, 060, 000 |
| Cod | 3, 047, 863, 700 | 132, 605, 200 |  | 3, 180, 468, 900 |
| Haddock | 1, 172, 796, 700 | 5, 768, 300 |  | 1, 178, 565, 000 |
| Flatfish (flounder) |  | 1, 185, 940, 100 |  | 1, 185, 940, 100 |
| Pollock | 1, 446, 519, 100 | 50, 762, 700 |  | 1, 497, 281, 800 |
| Lobster |  | 4, 048, 950 |  | 4, 048, 950 |
| Total | 5, 824, 802, 070 | 2, 115, 405, 660 | 84, 332, 955 | 8, 024, 540, 685 |

## PRODUCTION

The 1939 output of 8,024,540,685 fish and eggs was an insignificant reduction from the production for the previous year of 8,121,131,985. The former figure presents a yield derived almost 100 percent from the hatcheries, in comparison with the situation during previous years when an average of over 50 million fish was obtained from rescue and salvage operations. The negligible number of salvaged fish in the 1939 record is responsible for the noticeable decline in the distribution of fingerlings and larger fish. These amounted to 84,332,955 in comparison with 119,184,705 for 1938. All the fish formerly collected from the overflow areas of the upper Mississippi River were from 4 to 6 months old, and this stock must hereafter be replaced by fish reared in the hatchery ponds.

Sixteen varieties were propagated in larger numbers than during the previous year; among them the important chinook salmon, shad, lake trout, grayling, largemouth and smallmouth bass, pike perch, cod and haddock.

There was included in the total a production of 102,366,985 game and pan species, a percentage of approximately 1.3. As has been previously asserted, practically all the species propagated by the Bureau are sought by anglers to some degree. However, in designating "game and pan species" the Bureau is guided by the classifications of the State fisheries laws and by the determination of whether a given species supports an extensive commercial fishery. If such is the case, it is listed as a non-game species.

The most important point to be considered in analyzing the production records is the difference between gross and net output. The aggregate production of the individual hatcheries is greater than the actual or net plantings of fish because of the fact that transfers are made between different stations. The station hatching and shipping fish must of necessity be given credit for this production; and the station which subsequently rears and plants the fish is likewise entitled to credit for the number distributed. It is further evident that this involves a duplication in the summary or grand total. During 1939 there were 833,335 fish transferred between the stations. Deducting this from the grand total by species leaves a net distribution of 2,198,905,280 fish and 5,824,802,070 eggs as an actual increment to the fish population resulting from the Division's activities. For the same reason the record of distribution by States (see p. 596) will not check in its totals with the summary by species.

While extensive repair and improvement work was under way throughout the year at most of the stations, in very few instances did this interfere materially with the fish production. The Bureau has not as yet achieved its objective for the production of a greater proportion of trout and bass of legal size. Costs, both for fish food and personnel, as well as the increased expense of distributing larger fish, remain the chief limiting agents.

## CONSTRUCTION ACTIVITIES

Shortly before the start of the fiscal year the Division received an allotment of $808,500 from the Public Works Administration and $544,856 from the Works Progress Administration. The former was intended largely for the procurement of materials and supplies, while the latter was solely for labor. These amounts were reallocated to the various projects as listed in the following table:

*Stations receiving P. W. A. and W. P. A. allotments during the fiscal year 1939*

| Location | Amount of P. W. A. project | Amount of W. P. A. project | Location | Amount of P. W. A project | Amount of W. P. A. project |
|---|---|---|---|---|---|
| Alabama: Marion | $15,000 | $10,920 | Iowa: | | |
| Arkansas: Mammoth Spring | 5,000 | 3,500 | Fairport | $3,000 | $1,230 |
| California: | | | Guttenberg | 30,000 | 13,300 |
| Battle Creek | 5,000 | 3,500 | Manchester | 15,000 | 10,000 |
| Mill Creek | 5,000 | 3,000 | Kentucky: Louisville | 3,500 | 4,306 |
| Colorado: | | | Louisiana: Natchitoches | 10,000 | 15,000 |
| Creede | 3,500 | ---------- | Maine: | | |
| Leadville | 7,500 | 6,500 | Boothbay Harbor | 5,000 | 2,500 |
| Florida: Welaka | 30,000 | 23,000 | East Orland | 5,000 | 3,600 |
| Georgia: | | | Massachusetts: | | |
| Lake Park | 15,000 | 10,000 | Gloucester | 15,000 | 5,000 |
| Warm Springs | 15,000 | 10,000 | Hartsville | 5,000 | 5,000 |
| Cohutta | ---------- | 3,000 | Woods Hole | 15,000 | 10,000 |
| Idaho: | | | Michigan: | | |
| Hagerman | 10,000 | 5,000 | Charlevoix | 10,000 | 5,000 |
| Salmon | 5,000 | 5,000 | Northville | 15,000 | 10,000 |
| Indiana: Rochester | 18,000 | ---------- | Minnesota: Duluth | 7,500 | 2,500 |

*Stations receiving P. W. A. and W. P. A. allotments during the fiscal year 1939*—Continued

| Location | Amount of P.W.A. project | Amount of W.P.A. project |
|---|---|---|
| Mississippi: Tupelo | $10,000 | $5,000 |
| Missouri: Neosho | 10,000 | ---------- |
| Montana: | | |
| Bozeman | 10,000 | 5,000 |
| Ennis | 15,000 | 10,000 |
| Nebraska: Crawford | 5,000 | 5,000 |
| New Hampshire: | | |
| Nashua | 5,000 | 10,000 |
| York Pond (Berlin) | 10,000 | 18,000 |
| New Mexico: | | |
| Dexter | 10,000 | 5,000 |
| Santa Rosa | 5,000 | 5,000 |
| New York: | | |
| Cape Vincent | 15,000 | 12,400 |
| Cortland | 15,000 | 10,000 |
| North Carolina: | | |
| Edenton | 5,000 | 2,500 |
| Hoffman | 12,000 | 3,500 |
| Oklahoma: Reagan (near Tishomingo) | 15,000 | 25,000 |
| Oregon: | | |
| Butte Falls | 15,000 | ---------- |
| Clackamas | 15,000 | 12,500 |
| Pennsylvania: Lamar | 15,000 | 25,000 |
| South Carolina: | | |
| Orangeburg | 5,000 | 12,500 |
| Walhalla | 3,000 | 3,000 |
| South Dakota: Spearfish | 10,000 | 8,000 |
| Tennessee: | | |
| Erwin | 10,000 | 5,000 |
| Flintville | 7,500 | 17,500 |
| Texas: | | |
| Fort Worth | 40,000 | 20,000 |
| Inks Dam (Austin) | 35,000 | [1] |
| Texas—Continued. | | |
| San Angelo | $5,000 | $10,000 |
| San Marcos | 5,000 | 5,000 |
| Uvalde | 15,000 | 10,000 |
| Utah: | | |
| Laketown | 10,000 | 5,000 |
| Springville | 8,000 | 7,000 |
| Vermont: | | |
| Pittsford | 3,500 | 2,500 |
| St. Johnsbury | 5,000 | 5,000 |
| Swanton (Lakeland) | 3,500 | 2,500 |
| Virginia: | | |
| Fort Belvoir | 10,000 | ---------- |
| Wytheville | 15,000 | ---------- |
| Washington: | | |
| Big White Salmon | 5,000 | 5,000 |
| Birdsview | 10,000 | 10,000 |
| Carson | 10,000 | 10,000 |
| Little White Salmon | 15,000 | 5,000 |
| Quinault | 6,000 | 5,000 |
| Spokane | 5,000 | 5,000 |
| West Virginia: | | |
| Leetown | 48,000 | 51,600 |
| White Sulphur Springs | 8,000 | 7,000 |
| Wisconsin: | | |
| Genoa | 25,000 | ---------- |
| LaCrosse | 10,000 | 5,000 |
| Lake Mills | 8,000 | ---------- |
| Wyoming: Saratoga | 8,000 | 3,500 |
| Total | 808,500 | 544,856 |

[1] N. Y. A. labor furnished.

Certain supplementary W. P. A. allotments were received later in the year, increasing the amount available for labor. The work involved replacement of pipe lines; complete construction of new water-supply systems; construction, repair, and improvement of buildings; construction of ponds; installation of new equipment; and general landscaping. In some instances there was a 100-percent increase in the productive capacity of a station through such improvements.

The principal development of an entirely new nature was the construction of a pondfish hatchery at the Roy Inks Dam, on the lower Colorado River in Texas. The site was furnished by the Lower Colorado River Authority and construction was supervised by the Bureau. It was financed by a portion of the P. W. A. allotment and by the assignment of N. Y. A. labor. At the close of the year this project was virtually complete and some of the ponds were stocked with fingerling bass. The output of the establishment is planned for distribution in the series of reservoirs created on the Colorado River.

Noticeable improvements were effected at the Fort Worth (Tex.) station, where an additional tract of land was donated by the city of Fort Worth and utilized for the development of additional ponds. The Charlevoix (Mich.) Hatchery, which had been closed since 1933, was entirely rehabilitated and equipped for the rearing of lake trout fingerlings. In several instances State W. P. A. projects were also in effect and made possible additional improvements. An outstanding example of this was at Guttenberg, Iowa, where initial work on a large-scale pondfish hatchery, within the Upper Mississippi River Wildlife and Fish Refuge, was undertaken.

Curtailment of the scope of the Civilian Conservation Corps resulted in some restriction on the construction work prosecuted by this agency for the Bureau. A limited number of assignees were held on at Lamar, Pa., but the C. C. C. development program at the York Pond (N. H.) station was terminated, although the work was continued by the utilization of other funds.

At Arcadia, R. I., development of a bass hatchery by the Bureau and the Soil Conservation Service of the Department of Agriculture continued. This had been originally started as a recreational project under the Farm Security Administration and the major part of the construction has been continued by the successor to that agency. The Bureau contributed supervision and limited funds for the purchase of materials and equipment. Due to shortage of funds the work was suspended at the close of the year with the expectation that it would be resumed early in the fiscal year 1940.

The National Park Service secured an allotment of emergency funds for the construction of a new hatchery at Creston, near Kalispell, Mont. This establishment is intended to replace the obsolete Glacier Park fish hatchery, although it is located outside the boundaries of the park itself. The work, which was started in the spring, was being prosecuted by the National Park Service, with the Bureau represented in an advisory capacity. The operation of this hatchery is to be taken over by the Bureau upon completion.

In addition to the improvements made possible by direct cash allotments to the Bureau, the Appropriation Act for 1939 carried the sum of $155,000 providing for the construction of new hatcheries in Kansas, North Dakota, Minnesota, and Ohio. Early in the year a suitable site was located at Valley City, N. Dak., and construction work was started in the late fall. At the close of the year the hatchery was approximately 75 percent completed, although not in readiness for operation. At this point a State W. P. A. project was of material help in securing maximum returns from the appropriation available.

After a careful survey the three remaining hatcheries were designated for sites at Hebron, Ohio, Farlington, Kans., and New London, Minn. Various difficulties were encountered in acquiring clear titles to these sites, with resultant delay in starting actual construction. However, at the close of the year preparations were being made to initiate the construction phase at each of these locations, although no actual development had been undertaken. The appropriations made for these hatcheries were continued available during the fiscal year 1940.

The construction activities summarized above have resulted not only in actual increase of hatchery facilities but have also made it possible to take care of maintenance and rehabilitation work, the need for which has been accumulating over a number of years.

## COOPERATION WITH OTHER CONSERVATION AGENCIES

Much of the most effective work performed during the year has been in cooperation with one or more other public or private agencies whose functions relate to the conservation of fish life. Such coordination has been applied in matters as simple as the delivery of a consignment of fish or as complex as the development of a program for preserving the salmon run in the Columbia and the Sacramento Rivers, where the survival of the species is threatened by huge dam construction projects.

In working out the details of these various joint undertakings, frequent contact has been maintained with Federal departments, bureaus and agencies, with more than 30 State conservation departments, with several municipalities and county governments, and with innumerable sportsmen's and conservation organizations of a semipublic nature. The mechanism for coordination has consisted of broad general agreements, such as have been set up with the United States Forest Service, the National Park Service, the Tennessee Valley Authority, and several of the States. There have also been specific written agreements covering individual problems or projects as well as informal understandings reached by conference between field employees or headquarters officials. In the latter case the meetings of the National Planning Council of Fish and Game Commissioners have afforded an opportunity for channeling Federal and State fish-cultural activities toward maximum efficiency and utility.

As an indication of the manner in which conservation activities have been prosecuted on a joint basis, there are cited below various instances and examples. These do not present the full scope of such undertakings but space limitations necessitate many omissions.

The relationships maintained with the counties of Monroe and Onondaga, N. Y., for the purpose of propagating and distributing fish in local waters, have served as a model for a similar undertaking with the city of Danville, Va. Initial steps have been taken whereby the Bureau will supply fish for the maintenance of angling in lakes and streams developed by the city for hydroelectric purposes. The city will, according to plans, meet the costs of developing necessary facilities and caring for the fish.

The exchange of eggs and fish has been of material benefit, particularly in Michigan, Minnesota, and in some of the Western States, such as Oregon.

In the Tennessee Valley area three-way agreements between the Bureau of Fisheries, the Tennessee Valley Authority, and the States of Alabama, Tennessee, and North Carolina have been made effective or are being negotiated. The Tennessee Valley Authority had practically completed on June 30 a large pondfish hatchery on the Elk River in Alabama, and the Bureau was making arrangements to establish personnel and take over the operation. This is in addition to the hatchery already operated at Norris, Tenn., which is scheduled for enlargement. The fish produced at these facilities are to be distributed by the States in that part of the Tennessee Valley area which is included in the respective State boundaries.

In addition to cooperating with the National Park Service in the stocking of National Park waters, a brief reconnaissance and survey was made on the Chesapeake and Ohio Canal on the Potomac River above Washington, D. C. This property had been acquired by the National Park Service for recreational purposes, and it is expected that angling will be one of the outstanding recreational features. Agreement has been formulated whereby the Bureau will work with the Park Service in building up the angling.

In view of the tremendous responsibility of the Forest Service, of the Department of Agriculture, for the maintenance of fishing in the national forests, there has been need for unusual cooperation with that agency. A new trout-rearing unit was under construction in the Alleghany National Forest in Pennsylvania, in accordance with plans developed and approved by the Bureau, with the expectation that the unit would be operated by this Bureau upon completion.

The North Dakota Fish and Game Department donated to the Bureau the site for the new hatchery at Valley City, and further local assistance was received by the donation of pipe, a pump, etc. The North Carolina Fish and Game Department has contacted the Bureau freely and frequently relative to mutual problems, and it has been possible to render reciprocal assistance in the propagation of shad, the selection and inspection of hatchery sites for State development, and in the distribution of trout. A very large part of the production of the Marion (Ala.) station has been transported in State distribution trucks.

At St. Louis, Mo., the city officials have approved the construction, at no cost to the Bureau, of a modern administration and service building in the Forest Park hatchery. The series of ponds in the municipal park system was taken over by the Bureau for operation shortly before the start of the fiscal year 1939, and results have been most gratifying.

The State of Minnesota exhibited splendid cooperative spirit in donating to the Bureau a tract of land, together with the water rights, for the proposed hatchery at New London, and made available the services of its surveyors and engineers in acquiring additional property. Local interests raised a sum of money for the purchase of some of the additional acreage needed for the hatchery. The same cooperative assistance was obtained in Kansas, where the State Fish and Game Department donated water rights to a State-owned lake which is to serve as the primary water supply for the hatchery ponds.

Ohio purchased and donated to the Bureau a splendid location for the new hatchery to be constructed in that State. In consideration of this courtesy the Bureau approved the relinquishment to the State of the Federal hatchery property at Put in Bay. However, such action requires Congressional sanction, and the necessary legislation had not been passed at the close of the year.

Organized sportsmen's groups throughout the country have sought technical advice on stocking problems and have submitted many applications for fish to be reared in nursery ponds sponsored and maintained by these organizations.

## ASSIGNMENTS OF FISH AND FISH EGGS TO STATES, TERRITORIES, AND FOREIGN COUNTRIES

The transfer of approximately 166,000,000 fish and eggs to other fish-cultural agencies in the United States and its possessions was closely in line with the scope of such shipments in previous years. Forty States were the recipients of this form of Federal aid. In a number of cases the transfer was handled on an exchange basis, the Bureau being compensated by the State furnishing eggs or fish of needed species. The benefits in this procedure lie in the fact that many States were thus able to procure species which would be unobtainable from other sources. Also, where State hatchery facilities are limited in capacity, the Bureau's assignments have been the back-bone of the States' stocking programs. Some lobsters were turned over to Maine for rearing in the new State rearing station. Flounder fry were allocated to New Jersey from the Woods Hole (Mass.) station. Nebraska received a few grayling eggs, which would have been difficult to obtain elsewhere.

The Bureau had a surplus of certain species in some areas and has established the policy of disposing of such surpluses to nearby States whenever possible. The assignments reported in the following table should not be confused with the listing of Distribution by States, since the latter also covers fish delivered on applications or planted directly by Bureau employees.

*Assignments of fish and fish eggs to State fish commissions, fiscal year 1939*

| States and species | Eggs | Fry | Fingerlings, etc. | Total |
|---|---|---|---|---|
| Alabama: | | | | |
| Black bass, largemouth | | 19,000 | 92,925 | 111,925 |
| Sunfish | | | 507,720 | 507,720 |
| Arizona: | | | | |
| Blackspotted trout | 800,300 | | | 800,300 |
| Grayling | 100,000 | | | 100,000 |
| Colorado: | | | | |
| Blackspotted trout | 1,000,000 | | | 1,000,000 |
| Brook trout | | | 65,650 | 65,650 |
| Rainbow trout | | | 52,250 | 52,250 |
| Connecticut: | | | | |
| Black bass, smallmouth | | 386,000 | | 386,000 |
| Brook trout | | | 15,000 | 15,000 |
| Rainbow trout | 52,000 | | | 52,000 |
| Florida: Black bass, largemouth | | 6,000 | 15,550 | 21,550 |
| Georgia: | | | | |
| Black bass, largemouth | | 35,970 | 7,280 | 43,250 |
| Crappie | | | 900 | 900 |
| Sunfish | | | 165,500 | 165,500 |
| Idaho: | | | | |
| Blackspotted trout | 450,000 | | 98,700 | 548,700 |
| Brook trout | | | 1,500 | 1,500 |
| Rainbow trout | | | 135,730 | 135,730 |
| Sockeye salmon, landlocked | 122,960 | | 318,200 | 441,160 |
| Illinois: | | | | |
| Black bass, largemouth | | | 4,000 | 4,000 |
| Black bass, smallmouth | | 50,000 | | 50,000 |
| Pike perch | | 1,500,000 | | 1,500,000 |
| Sunfish | | | 24,000 | 24,000 |
| Indiana: | | | | |
| Black bass, largemouth | | | 50,500 | 50,500 |
| Brook trout | | | 75,000 | 75,000 |
| Loch Leven trout | | | 88,140 | 88,140 |
| Rainbow trout | | | 69,250 | 69,250 |
| Rock bass | | | 19,500 | 19,500 |
| Sunfish | | | 123,000 | 123,000 |
| Iowa: | | | | |
| Black bass, largemouth | | | 5,355 | 5,355 |
| Rock bass | | | 1,000 | 1,000 |
| Sunfish | | | 114,940 | 114,940 |
| Kentucky: Black bass, smallmouth | | 140,000 | 1,200 | 141,200 |
| Maine: Lobster | | 46,450 | | 46,450 |
| Maryland: | | | | |
| Black bass, largemouth | | | 35,125 | 35,125 |
| Rainbow trout | | | 43,235 | 43,235 |
| Massachusetts: | | | | |
| Brook trout | | | 75,000 | 75,000 |
| Lobster | | 40,000 | | 40,000 |
| Rainbow trout | 100,000 | | | 100,000 |
| Michigan: | | | | |
| Grayling | 100,500 | | | 100,500 |
| Rainbow trout | 509,500 | | | 509,500 |
| Sunfish | | | 25,000 | 25,000 |
| Minnesota: | | | | |
| Black bass, largemouth | | | 154,550 | 154,550 |
| Crappie | | | 10,125 | 10,125 |
| Loch Leven trout | 25,000 | | | 25,000 |
| Rainbow trout | 314,500 | | | 314,500 |
| Sunfish | | | 22,600 | 22,600 |
| Missouri: Black bass, smallmouth | | 100,000 | | 100,000 |

*Assignments of fish and fish eggs to State fish commissions, fiscal year 1939*—Con.

| States and species | Eggs | Fry | Fingerlings, etc. | Total |
|---|---|---|---|---|
| Montana: | | | | |
| Black bass, largemouth | | | 900 | 900 |
| Blackspotted trout | 2,500,800 | | | 2,500,800 |
| Brook trout | | | 42,600 | 42,600 |
| Catfish | | | 7,750 | 7,750 |
| Crappie | | | 1,330 | 1,330 |
| Chum salmon | 364,000 | | | 364,000 |
| Golden trout | | | 10,000 | 10,000 |
| Grayling | | | 26,700 | 26,700 |
| Loch Leven trout | | | 61,000 | 61,000 |
| Rainbow trout | 515,200 | | 1,625 | 516,825 |
| Nebraska: | | | | |
| Grayling | 25,000 | | 2,770 | 27,770 |
| Pike perch | 4,000,000 | | | 4,000,000 |
| Rainbow trout | | | 8,500 | 8,500 |
| Nevada: Chum salmon | 252,000 | | | 252,000 |
| New Hampshire: Brook trout | | 167,500 | | 167,500 |
| New Jersey: | | | | |
| Flounder | | 11,774,000 | | 11,774,000 |
| Rainbow trout | 155,000 | | 17,400 | 172,400 |
| New Mexico: | | | | |
| Black bass, largemouth | | | 130,525 | 130,525 |
| Black bass, smallmouth | | | 9,500 | 9,500 |
| Blackspotted trout | 1,100,500 | | | 1,100,500 |
| Catfish | | | 9,410 | 9,410 |
| Crappie | | | 24,310 | 24,310 |
| Rainbow trout | 1,000,800 | | | 1,000,800 |
| Sunfish | | | 424,050 | 424,050 |
| New York: Rainbow trout | 240,000 | | | 240,000 |
| North Carolina: | | | | |
| Black bass, largemouth | | 12,500 | 30,650 | 43,150 |
| Crappie | | | 10,200 | 10,200 |
| Rainbow trout | 514,200 | | 60,085 | 574,285 |
| Striped bass | | 693,750 | | 693,750 |
| Sunfish | | | 4,700 | 4,700 |
| North Dakota: | | | | |
| Black bass, largemouth | | | 49,040 | 49,040 |
| Crappie | | | 23,470 | 23,470 |
| Sunfish | | | 19,000 | 19,000 |
| Ohio: | | | | |
| Black bass, largemouth | | | 8,000 | 8,000 |
| Loch Leven trout | | | 25,000 | 25,000 |
| Rainbow trout | | | 25,150 | 25,150 |
| Rock bass | | | 7,500 | 7,500 |
| Sunfish | | | 30,000 | 30,000 |
| Oregon: | | | | |
| Blackspotted trout | 500,100 | | | 500,100 |
| Brook trout | | | 385,145 | 385,145 |
| Chinook salmon | | | 40,000 | 40,000 |
| Rainbow trout | | | 140,000 | 140,000 |
| Steelhead trout | | | 63,000 | 63,000 |
| Pennsylvania: Rainbow trout | | | 60,000 | 60,000 |
| Rhode Island: Flounder | | 121,445,000 | | 121,455,000 |
| South Carolina: | | | | |
| Black bass, largemouth | | | 32,900 | 32,900 |
| Rainbow trout | 200,000 | | 40,000 | 240,000 |
| South Dakota: | | | | |
| Black bass, largemouth | | | 14,000 | 14,000 |
| Blackspotted trout | | | 22,000 | 22,000 |
| Catfish | | | 20,800 | 20,800 |
| Crappie | | | 8,000 | 8,000 |
| Loch Leven trout | | | 12,500 | 12,500 |
| Rainbow trout | | | 60,000 | 60,000 |
| Sunfish | | | 20,000 | 20,000 |
| Tennessee: | | | | |
| Brook trout | | | 6,980 | 6,980 |
| Loch Leven trout | 52,490 | | | 52,490 |
| Rainbow trout | | | 36,000 | 36,000 |
| Rock bass | | | 1,800 | 1,800 |
| Sunfish | | | 6,500 | 6,500 |
| Utah: | | | | |
| Black bass, largemouth | | | 325 | 325 |
| Blackspotted trout | 700,400 | | | 700,400 |
| Chum salmon | 753,000 | | | 753,000 |
| Grayling | 994,300 | | | 994,300 |
| Vermont: | | | | |
| Brook trout | | 725,000 | | 725,000 |
| Landlocked salmon | | | 5,990 | 5,990 |
| Virginia: Rainbow trout | | | 200,755 | 200,755 |

*Assignments of fish and fish eggs to State fish commissions, fiscal year 1939*—Con.

| States and species | Eggs | Fry | Fingerlings, etc. | Total |
|---|---|---|---|---|
| Washington: | | | | |
| Blackspotted trout | 750,900 | | 26,180 | 777,080 |
| Brook trout | | | 97,000 | 97,000 |
| Sockeye salmon | 75,000 | | | 75,000 |
| Rainbow trout | | | 90,345 | 90,345 |
| West Virginia: | | | | |
| Black bass, largemouth | | | 9,250 | 9,250 |
| Black bass, smallmouth | | | 5,000 | 5,000 |
| Crappie | | | 10,610 | 10,610 |
| Loch Leven trout | | | 4,695 | 4,695 |
| Rainbow trout | | | 152,685 | 152,685 |
| Sunfish | | | 93,050 | 93,050 |
| White perch | | | 260 | 260 |
| Wisconsin: | | | | |
| Black bass, largemouth | | | 46,700 | 46,700 |
| Loch Leven trout | | | 20,000 | 20,000 |
| Wyoming: | | | | |
| Blackspotted trout | 4,231,300 | | | 4,231,300 |
| Brook trout | | | 15,600 | 15,600 |
| Grayling | 305,000 | | 10,000 | 315,000 |
| Rainbow trout | | | 30,000 | 30,000 |
| Total | 22,804,750 | 137,151,170 | 5,227,660 | 165,233,580 |

The shipment of fish and eggs to foreign countries has been an interesting but unimportant activity of the Division for many years. While such consignments have been furnished gratis from available hatchery stocks, no expense has been incurred in forwarding the shipments. During the past year an initial shipment of 250,000 lake trout eggs was sent to Peru, as a start on a program of establishing this species in Lake Titicaca. Due to insufficient time for the necessary preparation and scheduling of the shipment, the eggs were a total loss. Rainbow eggs were sent to England as a means of introducing new blood into the existent stocks of the species in that country. Rainbow trout eggs and fry were sent to Costa Rica and Colombia as an experiment, with little success. As usual, rainbow eggs were forwarded to Puerto Rico in line with plans to develop angling as a means of attracting tourists to that island.

There were additional inquiries from serveral other countries relative to securing some species of American fishes, but for various reasons no action was taken.

*Shipments of fish and fish eggs to territories and foreign countries, fiscal year 1939*

| Destination and species | Shipping station | Eggs | Fry | Fingerlings, etc. | Total |
|---|---|---|---|---|---|
| Colombia: | | | | | |
| Brook trout | New York Aquarium | | 150 | | 150 |
| Rainbow trout | do | | 150 | | 150 |
| Do | Leetown, W. Va. | | | 100 | 100 |
| Costa Rica: Rainbow trout | Neosho, Mo. | 25,000 | | | 25,000 |
| England: Rainbow trout | White Sulphur Springs, W. Va. | 50,000 | | | 50,000 |
| Peru: Lake trout | Cape Vincent, N. Y. | 250,000 | | | 250,000 |
| Puerto Rico: | | | | | |
| Rainbow trout | Bourbon, Mo. | 250,000 | | | 250,000 |
| Do | Eagle Nest, N. Mex. | 151,000 | | | 151,000 |
| Total | | 726,000 | 300 | 100 | 726,400 |

## TRANSFER OF EGGS BETWEEN STATIONS

The economy of concentrating upon egg production at 3 or 4 stations, from which shipments can be made to other points, has frequently been emphasized. This practice was continued throughout the past year and over 43 million eggs of 10 different species were transferred between various stations. The following table sets forth in detail all such transfers.

*Transfer of eggs between stations, fiscal year 1939*

| Species | Number of eggs | From— | To— |
|---|---|---|---|
| Blackspotted trout | 200, 340 | Saratoga, Wyo | Jackson, Wyo. |
| | 200, 300 | Yellowstone Park, Wyo | Baker Lake, Wash. |
| | 300, 100 | do | Birdsview, Wash. |
| | 2, 625, 300 | do | Bozeman, Mont. |
| | 600, 200 | do | Carson, Wash. |
| | 250, 100 | do | Clackamas, Oreg. |
| | 1, 150, 200 | do | Crawford, Nebr. |
| | 400, 200 | do | Creede, Colo. |
| | 100, 100 | do | Eagle Nest, N. Mex. |
| | 811, 400 | do | Ennis, Mont. |
| | 3, 000, 800 | do | Glacier Park, Mont. |
| | 725, 400 | do | Hagerman, Idaho. |
| | 1, 000, 300 | do | Jackson, Wyo. |
| | 100, 100 | do | Laketown, Utah. |
| | 575, 400 | do | Leadville, Colo. |
| | 25, 200 | do | Leetown, W. Va. |
| | 650, 400 | do | Mount Rainier, Wash. |
| | 300, 100 | do | Quilcene, Wash. |
| | 200, 000 | do | Quinault, Wash. |
| | 475, 400 | do | Salmon, Idaho. |
| | 800, 300 | do | Saratoga, Wyo. |
| | 50, 200 | do | Spearfish, S. Dak. |
| | 300, 200 | do | Spokane, Wash. |
| | 1, 025, 500 | do | Springville, Utah. |
| Brook trout | 358, 500 | Cape Vincent, N. Y | Barneveld, N. Y. |
| | 300, 000 | do | Cortland, N. Y. |
| | 50, 000 | Craig Brook, Maine | Cape Vincent, N. Y. |
| | 250, 000 | do | Cortland, N. Y. |
| | 600, 000 | do | Lamar, Pa. |
| | 228, 000 | do | Nashua, N. H. |
| | 500, 000 | do | Walhalla, S. C. |
| | 300, 000 | do | White Sulphur Springs, W. Va. |
| | 500, 000 | do | Wytheville, Va. |
| | 100, 000 | Leadville, Colo | Hagerman, Idaho. |
| | 100, 000 | do | Laketown, Utah. |
| | 100, 000 | do | Saratoga, Wyo. |
| | 100, 000 | Creede, Colo | Laketown, Utah. |
| | 100, 000 | do | Spearfish, S. Dak. |
| | 362, 000 | do | Springville, Utah. |
| | 300, 000 | National Forest of New Hampshire. | La Crosse, Wis. |
| | 386, 750 | do | St. Johnsbury, Vt. |
| | 100, 000 | do | Walhalla, S. C. |
| | 150, 000 | Pittsford, Vt | Leetown, W. Va. |
| Chinook salmon | 2, 878, 000 | Little White Salmon | Carson, Wash. |
| Chum salmon | 233, 470 | Quilcene, Wash | Laketown, Utah. |
| | 3, 475, 000 | Walcott Sloughs, Wash | Duckabush, Wash. |
| | 4, 630, 000 | do | Quilcene, Wash. |
| Grayling | 300, 000 | Yellowstone Park, Wyo | Bozeman, Mont. |
| | 250, 100 | do | Ennis, Mont. |
| | 100, 000 | do | Jackson, Wyo. |
| | 275, 500 | do | Springville, Utah. |
| Lake trout | 50, 000 | Cape Vincent, N. Y | Craig Brook, Maine. |
| | 63, 000 | do | Rochester, N. Y. |
| | 201, 000 | Duluth, Minn | Cape Vincent, N. Y. |
| | 25, 920 | do | Laketown, Utah. |
| | 25, 000 | do | Leadville, Colo. |
| Loch Leven trout | 57, 450 | Cape Vincent, N. Y | Barneveld, N. Y. |
| | 50, 880 | do | Cortland, N. Y. |
| Pike perch | 525, 000 | Put in Bay, Ohio | Norris, Tenn. |
| | 525, 000 | do | Wytheville, Va. |
| Rainbow trout | 200, 000 | Eagle Nest, N. Mex | Crawford, Nebr. |
| | 500, 000 | do | Creede, Colo. |
| | 250, 000 | do | Bozeman, Mont. |
| | 600, 000 | do | Leadville, Colo. |
| | 239, 000 | do | Springville, Utah. |

*Transfer of eggs between stations, fiscal year 1939*—Continued

| Species | Number of eggs | From— | To— |
|---|---|---|---|
| Rainbow trout | 5,250 | Leetown, W. Va | Aquarium, Washington, D. C. |
| | 104,100 | do | Barneveld, N. Y. |
| | 51,030 | do | Craig Brook, Maine. |
| | 50,540 | do | Hartsville, Mass. |
| | 201,000 | do | Lamar, Pa. |
| | 311,100 | Manchester, Iowa | Bozeman, Mont. |
| | 328,200 | do | Crawford, Nebr. |
| | 102,000 | do | Duluth, Minn. |
| | 203,800 | do | LaCrosse, Wis. |
| | 76,900 | do | Lake Mills, Wis. |
| | 102,000 | do | Northville, Mich. |
| | 25,000 | Neosho, Mo | Cortland, N. Y. |
| | 121,000 | do | Erwin, Tenn. |
| | 103,000 | do | Lamar, Pa. |
| | 1,109,500 | do | Saratoga, Wyo. |
| | 412,000 | do | Smokemont, N. C. |
| | 317,000 | do | Walhalla, S. C. |
| | 75,000 | Salmon, Idaho | Birdsview, Wash. |
| | 170,000 | do | Carson, Wash. |
| | 158,000 | do | Hagerman, Idaho. |
| | 100,000 | do | Smokemont, N. C. |
| | 200,000 | do | Spokane, Wash. |
| | 250,000 | Springville, Utah | Carson, Wash. |
| | 50,000 | do | Hagerman, Idaho. |
| | 100,000 | do | Laketown, Utah. |
| | 15,100 | do | Seattle, Wash. |
| | 190,100 | do | Spokane, Wash. |
| | 100,000 | White Sulphur Springs, W. Va | Cortland, N. Y. |
| | 100,000 | do | Craig Brook, Maine. |
| | 50,000 | do | Hartsville, Mass. |
| | 50,000 | do | Nashua, N. H. |
| | 250,000 | Wytheville, Va | Flintville, Tenn. |
| | 100,000 | do | LaCrosse, Wis. |
| | 75,000 | do | Rochester, N. Y. |
| | 825,000 | Yellowstone Park, Wyo | Ennis, Mont. |
| | 400,200 | do | Glacier Park, Mont. |
| Steelhead trout | 25,000 | Birdsview, Wash | Leadville, Colo. |

## STATION OUTPUT

The following list of producing units represents an increase of 6 stations over the previous year. The 1939 production was obtained from a total of 52 main stations and 46 substations located in 39 States. Although the output of each of these units is primarily intended for the restocking of waters in contiguous areas, the production of any of them may, nevertheless, reach 2 or 3 different States.

The Marianna (Fla.), Las Vegas (Nev.), Cohutta (Ga.), and Lyman (Miss.), stations, which were constructed during the fiscal year 1938, as authorized by the act of May 21, 1930, were among those that contributed for the first time this season.

The Genoa (Wis.), unit, which is being constructed in the Upper Mississippi Wild Life and Fish Refuge, was completed to such an extent that three ponds, with an area of approximately 60 acres, were placed under production in the spring of 1939. During the month of June there were collected and distributed from these ponds approximately 2 million fingerling black bass. The Palestine (W. Va.) station, which is owned by the West Virginia Conservation Commission, was operated in cooperation with that agency for the stocking of waters in the western part of West Virginia, and therefore appears in the following summary. The Clark Fork (Idaho) unit was constructed as a W. P. A. project sponsored by the Idaho Fish and Game Department on land donated by the Bonner County

Sportsmen's Association. After being turned over to the Bureau on September 11, 1938, it was immediately placed on a productive basis. The Carpenter's Brook (N. Y.) station, which is operated in cooperation with the Onondaga County sportsmen, was nearly completed and an output of trout was attained.

Due to the development of the 9-foot channel in the upper Mississippi River, rescue operations were discontinued from the Lynxville (Wis.) and Homer (Minn.) stations. The latter unit was maintained as a repair shop and supply depot.

*Stations and substations operated and the output of each, fiscal year 1939*

| Stations, substations, and species | Eggs | Fry | Fingerlings | Total |
|---|---|---|---|---|
| Berlin, N. H.: | | | | |
| Brook trout | | 67,500 | 325,915 | 393,415 |
| Lake trout | | | 3,500 | 3,500 |
| Rainbow trout | | | 1,100 | 1,100 |
| *St. Johnsbury, Vt.:* | | | | |
| Black bass, largemouth | | | 1,275 | 1,275 |
| Brook trout | | 1,235,000 | | 1,235,000 |
| Landlocked salmon | | | 5,990 | 5,990 |
| Birdsview, Wash.: | | | | |
| Blackspotted trout | | | 209,500 | 209,500 |
| Brook trout | | | 97,000 | 97,000 |
| Rainbow trout | 10,000 | | 178,700 | 188,700 |
| Steelhead trout | 35,000 | | 813,700 | 848,700 |
| Chum salmon | | | 140,000 | 140,000 |
| Silver salmon | | | 362,000 | 362,000 |
| Sockeye salmon | | | 27,370 | 27,370 |
| *Mount Rainier, Wash.:* | | | | |
| Blackspotted trout | | | 5,000 | 5,000 |
| *Spokane, Wash.:* | | | | |
| Blackspotted trout | | | 64,380 | 64,380 |
| Brook trout | | | 3,000 | 3,000 |
| Rainbow trout | | | 161,375 | 161,375 |
| Boothbay Harbor, Maine: | | | | |
| Cod | 1,419,860,000 | | | 1,419,860,000 |
| Flatfish | | 603,000,000 | | 603,000,000 |
| Haddock | 417,832,000 | | | 417,832,000 |
| Lobster | | 2,900,450 | | 2,900,450 |
| Pollock | 517,305,000 | | | 517,305,000 |
| Bozeman, Mont.: | | | | |
| Blackspotted trout | 4,000 | | 1,193,080 | 1,197,080 |
| Brook trout | | | 283,260 | 283,260 |
| Golden trout | 6,100 | | 71,040 | 77,140 |
| Loch Leven trout | 25,000 | | | 25,000 |
| Rainbow trout | 515,200 | | 345,660 | 860,860 |
| Grayling | | | 231,050 | 231,050 |
| *Glacier Park., Mont.:* | | | | |
| Blackspotted trout | | 1,858,820 | | 1,858,820 |
| Rainbow trout | | 238,140 | | 238,140 |
| *Ennis, Mont.:* | | | | |
| Blackspotted trout | | | 448,040 | 448,040 |
| Loch Leven trout | | | 268,400 | 268,400 |
| Rainbow trout | | | 609,000 | 609,000 |
| Grayling | | 200,000 | 27,000 | 227,000 |
| *Miles City, Mont.:* | | | | |
| Black bass, largemouth | | | 20,505 | 20,505 |
| Sunfish | | | 114,680 | 114,680 |
| Catfish | | | 45,065 | 45,065 |
| Crappie | | | 69,250 | 69,250 |
| Cape Vincent, N. Y.: | | | | |
| Black bass, smallmouth | | 64,400 | 27,735 | 92,135 |
| Brook trout | | 108,000 | | 108,000 |
| Lake trout | 250,000 | 759,000 | | 1,009,000 |
| Loch Leven trout | | | 1,000 | 1,000 |
| Whitefish | | 20,000 | | 20,000 |
| *Barneveld, N. Y.:* | | | | |
| Brook trout | | | 142,800 | 142,800 |
| Loch Leven trout | | | 44,490 | 44,490 |
| Rainbow trout | | | 15,430 | 15,430 |
| *Cortland, N. Y.:* | | | | |
| Brook trout | | | 325,600 | 325,600 |
| Lake trout | | | 9,870 | 9,870 |
| Loch Leven trout | | | 12,600 | 12,600 |
| Rainbow trout | | | 22,755 | 22,755 |

NOTE.—Stations *italicized* are substations of the preceding station in roman type.

*Stations and substations operated and the output of each, fiscal year 1939*—Continued

| Stations, substations, and species | Eggs | Fry | Fingerlings | Total |
|---|---|---|---|---|
| *Watertown, N. Y.:* | | | | |
| Brook trout | | | 41, 290 | 41, 290 |
| Lake trout | | | 300 | 300 |
| Loch Leven trout | | | 17, 625 | 17. 625 |
| Rainbow trout | | | 16, 055 | 16, 055 |
| Carson, Wash.: | | | | |
| Blackspotted trout | | | 254, 000 | 254, 000 |
| Brook trout | | | 294, 750 | 294, 750 |
| Rainbow trout | | | 228, 000 | 228, 000 |
| Chinook salmon | | 1, 998, 710 | 674, 430 | 2, 673, 140 |
| *Little White Salmon, Wash.:* | | | | |
| Chinook salmon | 5, 060, 000 | 9, 216, 000 | 1, 750, 000 | 16, 026, 000 |
| *Big White Salmon, Wash.:* | | | | |
| Brook trout | | | 174, 000 | 174, 000 |
| Chinook salmon | 25, 000 | 10, 597, 900 | 3, 875, 300 | 14, 498, 200 |
| Clackamas, Oreg.: | | | | |
| Brook trout | | | 508, 145 | 508, 145 |
| Chinook salmon | 2, 200 | | 1, 029, 250 | 1, 031, 450 |
| Rainbow trout | | | 87, 000 | 87, 000 |
| *Battle Creek, Calif.:* | | | | |
| Chinook salmon | 520, 000 | | 10, 736, 505 | 11, 256, 505 |
| *Butte Falls, Oreg.:* | | | | |
| Chinook salmon | | | 917, 030 | 917, 030 |
| Rainbow trout | | | 140, 000 | 140, 000 |
| Steelhead trout | | | 63, 000 | 63, 000 |
| *Mill Creek, Calif.:* | | | | |
| Chinook salmon | | | 7, 352, 000 | 7, 352, 000 |
| Clark Fork, Idaho: | | | | |
| Blackspotted trout | | | 225, 000 | 225, 000 |
| Sockeye salmon, landlocked | 122, 960 | | 318, 200 | 441, 160 |
| Craig Brook, Maine: | | | | |
| Brook trout | | | 553, 620 | 553, 620 |
| Lake trout | | | 67, 800 | 67, 800 |
| Rainbow trout | | | 4, 800 | 4, 800 |
| Crawford, Nebr.: | | | | |
| Blackspotted trout | | | 398, 000 | 398. 000 |
| Brook trout | | | 374, 350 | 374, 350 |
| Rainbow trout | | | 568, 080 | 568, 080 |
| Black bass, largemouth | | | 67, 450 | 67, 450 |
| Rock bass | | | 5, 115 | 5, 115 |
| Sunfish | | | 13, 150 | 13, 150 |
| Catfish | | | 72, 625 | 72, 625 |
| Crappie | | | 28, 775 | 28, 775 |
| Yellow perch | | | 10, 000 | 10, 000 |
| Dexter, N. Mex.: | | | | |
| Black bass, largemouth | | | 471, 350 | 471, 350 |
| Sunfish | | | 468, 600 | 468, 600 |
| Catfish | | | 19, 090 | 19, 090 |
| Crappie | | | 29, 310 | 29, 310 |
| *Santa Rosa, N. Mer.:* | | | | |
| Black bass, largemouth | | | 48, 200 | 48, 200 |
| Black bass, smallmouth | | | 11, 000 | 11, 000 |
| Sunfish | | | 63, 050 | 63, 050 |
| Catfish | | | 1, 940 | 1, 940 |
| Crappie | | | 3, 320 | 3, 320 |
| Duluth, Minn.: | | | | |
| Brook trout | | | 174, 000 | 174, 000 |
| Lake trout | 26, 280 | 877, 750 | | 904, 030 |
| Loch Leven trout | | | 47, 000 | 47, 000 |
| Rainbow trout | | | 20, 000 | 20, 000 |
| Lake herring | | 3, 000, 000 | | 3, 000, 000 |
| Pike perch | | 13, 640, 000 | | 13, 640, 000 |
| Whitefish | | 900, 000 | | 900, 000 |
| Edenton. N. C.: | | | | |
| Black bass, largemouth | | 112, 000 | 70, 200 | 182, 200 |
| Sunfish | | | 8, 000 | 8, 000 |
| Crappie | | | 4, 625 | 4, 625 |
| Shad | | 6, 615, 000 | | 6, 615, 000 |
| Yellow perch | | 998, 000 | 140 | 998, 140 |
| White perch | | 4, 300, 000 | | 4, 300, 000 |
| *Weldon, N. C.:* | | | | |
| Striped bass | | 1, 797, 950 | | 1, 797, 950 |
| Elephant Butte, N. Mex.: | | | | |
| Black bass, largemouth | | | 373. 750 | 373, 750 |
| Sunfish | | | 142, 500 | 142, 500 |
| Crappie | | | 8, 400 | 8, 400 |
| Erwin, Tenn.: | | | | |
| Black bass, largemouth | | 985, 500 | 78, 235 | 1, 063, 735 |
| Black bass, smallmouth | | | 24, 000 | 24, 000 |
| Rock bass | | | 8, 575 | 8, 575 |
| Sunfish | | | 40, 630 | 40, 630 |
| Brook trout | | | 191, 755 | 191, 755 |
| Rainbow trout | | | 450, 830 | 450, 830 |

*Stations and substations operated and the output of each, fiscal year 1939*—Continued

| Stations, substations, and species | Eggs | Fry | Fingerlings | Total |
|---|---|---|---|---|
| Fairport, Iowa: | | | | |
| Black bass, largemouth | | 18,000 | 103,410 | 121,410 |
| Black bass, smallmouth | | | 3,600 | 3,600 |
| Buffalofish | 38,850,000 | | 800 | 38,850,800 |
| Catfish | | 10,000 | 224,135 | 234,135 |
| Crappie | | | 9,300 | 9,300 |
| Sunfish | | | 360,240 | 360,240 |
| Flintville, Tenn.: | | | | |
| Black bass, largemouth | | | 6,600 | 6,600 |
| Black bass, smallmouth | | | 4,750 | 4,750 |
| Rock bass | | | 1,200 | 1,200 |
| Crappie | | | 550 | 550 |
| Brook trout | | | 5,500 | 5,500 |
| Rainbow trout | | | 119,450 | 119,450 |
| Sunfish | | | 22,550 | 22,550 |
| Fort Belvoir, Va.: | | | | |
| Black bass, largemouth | | | 500 | 500 |
| Catfish | | | 50 | 50 |
| Crappie | | | 200 | 200 |
| Shad | | 26,000,000 | | 26,000,000 |
| Sunfish | | | 20,590 | 20,590 |
| Yellow perch | | 299,668,000 | 1,850 | 299,669,850 |
| Gloucester, Mass.: | | | | |
| Cod | 1,628,003,700 | 132,605,200 | | 1,760,608,900 |
| Flatfish | | 14,410,100 | | 14,410,100 |
| Haddock | 754,964,700 | 5,768,300 | | 760,733,000 |
| Lobster | | 1,148,500 | | 1,148,500 |
| Pollock | 929,214,100 | 50,762,700 | | 979,976,800 |
| Hagerman, Idaho: | | | | |
| Blackspotted trout | | | 245,200 | 245,200 |
| Brook trout | | | 115,545 | 115,545 |
| Rainbow trout | | | 473,660 | 473,660 |
| Sockeye salmon | | | 159,870 | 159,870 |
| *Salmon, Idaho:* | | | | |
| Blackspotted trout | | | 137,900 | 137,900 |
| Rainbow trout | | | 1,078,920 | 1,078,920 |
| Steelhead trout | | | 17,360 | 17,360 |
| Hartsville, Mass.: | | | | |
| Black bass, smallmouth | | 773,000 | | 773,000 |
| Brook trout | | | 363,755 | 363,755 |
| Rainbow trout | | | 27,345 | 27,345 |
| LaCrosse, Wis.: | | | | |
| Black bass, largemouth | | | 66,550 | 66,550 |
| Brook trout | | | 615,100 | 615,100 |
| Loch Leven trout | | | 232,700 | 232,700 |
| Rainbow trout | | | 234,800 | 234,800 |
| Crappie | | | 1,225 | 1,225 |
| Sunfish | | | 1,500 | 1,500 |
| Yellow perch | | | 50 | 50 |
| *Bellevue, Iowa:* | | | | |
| Buffalofish | 39,191,500 | | | 39,191,500 |
| *Genoa, Wis.:* | | | | |
| Black bass, largemouth | | | 1,926,220 | 1,926,220 |
| Black bass, smallmouth | | | 15,345 | 15,345 |
| Catfish | | | 6,300 | 6,300 |
| Crappie | | | 18,295 | 18,295 |
| Sunfish | | | 25,175 | 25,175 |
| Yellow perch | | | 600 | 600 |
| *Guttenberg, Iowa:* | | | | |
| Black bass, largemouth | | | 2,620 | 2,620 |
| Black bass, smallmouth | | | 1,060 | 1,000 |
| Buffalofish | 640,000 | | | 640,000 |
| Catfish | | | 14,700 | 14,700 |
| Crappie | | | 57,370 | 57,370 |
| Pike and pickerel | 1,643,150 | | | 1,613,150 |
| Pike perch | 271,950 | | | 271,950 |
| Sunfish | | | 48,100 | 48,100 |
| *Lake Mills, Wis.:* | | | | |
| Black bass, largemouth | | | 216,875 | 216,875 |
| Black bass, smallmouth | | | 6,625 | 6,625 |
| Crappie | | | 2,200 | 2,200 |
| Brook trout | | | 85,050 | 85,050 |
| Loch Leven trout | | | 63,320 | 63,320 |
| Rainbow trout | | | 83,200 | 83,200 |
| *Marquette, Iowa:* | | | | |
| Black-bass, largemouth | | | 6,040 | 6,040 |
| Crappie | | | 5,035 | 5,035 |
| Sunfish | | | 1,205 | 1,205 |
| Lake Park, Ga.: | | | | |
| Black bass, largemouth | | | 26,600 | 26,600 |
| Catfish | | | 2,050 | 2,050 |
| Crappie | | | 900 | 900 |
| Sunfish | | | 101,300 | 101,300 |

*Stations and substations operated and the output of each, fiscal year 1939*—Continued

| Stations, substations, and species | Eggs | Fry | Fingerlings | Total |
|---|---|---|---|---|
| Lamar, Pa.: | | | | |
| Brook trout | | | 293, 140 | 293, 140 |
| Loch Leven trout | | | 112, 090 | 112, 090 |
| Rainbow trout | | | 256, 650 | 256, 650 |
| *Ogletown, Pa.:* | | | | |
| Brook trout | | | 17, 050 | 17, 050 |
| Las Vegas, Nev.: | | | | |
| Black bass, largemouth | | | 80, 000 | 80, 000 |
| Leadville, Colo.: | | | | |
| Blackspotted trout | | | 500, 400 | 500, 400 |
| Brook trout | | | 659, 200 | 659, 200 |
| Loch Leven trout | | | 102, 800 | 102, 800 |
| Rainbow trout | | | 527, 570 | 527, 570 |
| *Creede, Colo.:* | | | | |
| Blackspotted trout | | | 391, 500 | 391, 500 |
| Brook trout | | | 1, 292, 900 | 1, 292, 900 |
| Rainbow trout | | | 487, 600 | 487, 600 |
| *Eagle Nest, N. Mex.:* | | | | |
| Blackspotted trout | | | 93, 000 | 93, 000 |
| Brook trout | | | 57, 900 | 57, 900 |
| Rainbow trout | 1, 151, 800 | | 429, 500 | 1, 581, 300 |
| Leetown, W. Va.: | | | | |
| Black bass, largemouth | | | 9, 040 | 9, 040 |
| Black bass, smallmouth | | | 9, 070 | 9, 070 |
| Brook trout | 5, 000 | | 25, 850 | 30, 850 |
| Lock Leven trout | 52, 500 | | 58, 945 | 111, 445 |
| Rainbow trout | 3, 000 | | 540, 940 | 543, 940 |
| Sunfish | | | 10, 950 | 10, 950 |
| Louisville, Ky.: | | | | |
| Black bass, largemouth | | 48, 000 | 15, 680 | 63, 680 |
| Black bass, smallmouth | | 323, 600 | 10, 980 | 334, 580 |
| Rock bass | | | 17, 400 | 17, 400 |
| Crappie | | | 300 | 300 |
| Sunfish | | | 11, 475 | 11, 475 |
| Mammoth Spring, Ark.: | | | | |
| Black bass, largemouth | | | 202, 050 | 202, 050 |
| Black bass, smallmouth | | 237, 000 | 150, 000 | 387, 000 |
| Rock bass | | | 5, 600 | 5, 600 |
| Sunfish | | | 22, 000 | 22, 000 |
| Manchester, Iowa: | | | | |
| Black bass, largemouth | | | 950 | 950 |
| Rock bass | | | 14, 000 | 14, 000 |
| Brook trout | | | 173, 700 | 173, 700 |
| Loch Leven trout | | | 139, 700 | 139, 700 |
| Rainbow trout | 1, 338, 200 | | 120, 225 | 1, 458, 425 |
| Marion, Ala.: | | | | |
| Black bass, largemouth | | 504, 000 | 563, 590 | 1, 067, 590 |
| Rock bass | | | 1, 770 | 1, 770 |
| Crappie | | | 420 | 420 |
| Sunfish | | | 2, 158, 610 | 2, 158, 610 |
| *Cohutta, Ga.:* | | | | |
| Black bass, largemouth | | 6, 000 | 16, 000 | 22, 000 |
| Black bass, smallmouth | | 2, 500 | | 2, 500 |
| Kentucky bass | | 5, 000 | 2, 250 | 7, 250 |
| *Lyman, Miss.:* | | | | |
| Black bass, largemouth | | | 162, 690 | 162, 690 |
| Sunfish | | | 521, 200 | 521, 200 |
| *Marianna, Fla.:* | | | | |
| Black bass, largemouth | | 114, 000 | 92, 650 | 206, 650 |
| *Tupelo, Miss.:* | | | | |
| Black bass, largemouth | | 198, 000 | 383, 485 | 581, 485 |
| Sunfish | | | 271, 905 | 271, 905 |
| *Warm Springs, Ga.:* | | | | |
| Black bass, largemouth | | 250, 000 | 24, 380 | 274, 380 |
| Catfish | | | 7, 220 | 7, 220 |
| Sunfish | | | 172, 185 | 172, 185 |
| Nashua, N. H.: | | | | |
| Brook trout | | | 173, 060 | 173, 060 |
| Loch Leven trout | | | 3, 400 | 3, 400 |
| Rainbow trout | | | 8, 815 | 8, 815 |
| Catfish | | | 200 | 200 |
| Neosho, Mo.: | | | | |
| Black bass, largemouth | | 496, 000 | 97, 515 | 593, 515 |
| Rock bass | | | 9, 900 | 9, 900 |
| Catfish | | | 4, 750 | 4, 750 |
| Crappie | | | 32, 900 | 32, 900 |
| Rainbow trout | 53, 500 | | 59, 845 | 113, 345 |
| Sunfish | | | 20, 790 | 20, 790 |
| *Forest Park, Mo.:* | | | | |
| Black bass, largemouth | | | 239, 220 | 239, 220 |
| Crappie | | | 19, 850 | 19, 850 |
| Catfish | | | 6, 300 | 6, 300 |
| Sunfish | | | 125, 200 | 125, 200 |

*Stations and substations operated and the output of each, fiscal year 1939*—Continued

| Stations, substations, and species | Eggs | Fry | Fingerlings | Total |
|---|---|---|---|---|
| *Natchitoches, La.:* | | | | |
| Black bass, largemouth | | 117, 000 | 188, 330 | 305, 330 |
| Warmouth bass | | | 42, 115 | 42, 115 |
| Sunfish | | | 601, 200 | 601, 200 |
| *Tishomingo, Okla.:* | | | | |
| Black bass, largemouth | | | 81, 500 | 81, 500 |
| Crappie | | | 26, 830 | 26, 830 |
| Sunfish | | | 608, 650 | 608, 650 |
| Northville, Mich.: | | | | |
| Black bass, largemouth | | | 6, 395 | 6, 395 |
| Black bass, smallmouth | | | 9, 225 | 9, 225 |
| Brook trout | | | 725, 070 | 725, 070 |
| Loch Leven trout | | | 71, 240 | 71, 240 |
| Rainbow trout | | | 184, 185 | 184, 185 |
| Sunfish | | | 120, 050 | 120, 050 |
| Orangeburg, S. C.: | | | | |
| Black bass, largemouth | | | 512, 395 | 512, 395 |
| Warmouth bass | | | 12, 200 | 12, 200 |
| Catfish | | | 500 | 500 |
| Crappie | | | 815 | 815 |
| Sunfish | | | 481, 475 | 481, 475 |
| Yellow perch | | | 1, 800 | 1, 800 |
| *Jacksonboro, S. C.:* | | | | |
| Shad | | 1, 534, 000 | | 1, 534, 000 |
| *Hoffman, N. C.:* | | | | |
| Black bass, largemouth | | 25, 000 | 193, 700 | 218, 700 |
| Warmouth bass | | | 36, 000 | 36, 000 |
| Crappie | | | 54, 050 | 54, 050 |
| Sunfish | | | 534, 365 | 534, 365 |
| Palestine, W. Va.: | | | | |
| Black bass, largemouth | | | 10, 250 | 10, 250 |
| Black bass, smallmouth | | | 5, 050 | 5, 050 |
| Sunfish | | | 147, 150 | 147, 150 |
| Crappie | | | 18, 800 | 18, 800 |
| White perch | | | 260 | 260 |
| Pisgah Forest, N. C.: | | | | |
| Brook trout | | | 14, 200 | 14, 200 |
| Loch Leven trout | | | 13, 145 | 13, 145 |
| Rainbow trout | | | 22, 620 | 22, 620 |
| Pittsford, Vt.: | | | | |
| Brook trout | | | 40, 530 | 40, 530 |
| Rainbow trout | | | 3, 800 | 3, 800 |
| Put in Bay, Ohio: | | | | |
| Pike perch | 4, 000, 000 | 316, 000, 000 | | 320, 000, 000 |
| Whitefish | 32, 960, 000 | | | 32, 960, 000 |
| Quinault, Wash.: | | | | |
| Chinook salmon | | | 116, 250 | 116, 250 |
| Silver salmon | | | 140, 510 | 140, 510 |
| Sockeye salmon | 75, 000 | | 1, 926, 665 | 2, 001, 665 |
| Blackspotted trout | | | 81, 040 | 81, 040 |
| Rainbow trout | | | 24, 125 | 24, 125 |
| Steelhead trout | | | 2, 175 | 2, 175 |
| *Duckabush, Wash.:* | | | | |
| Chum salmon | | 4, 762, 900 | | 4, 762, 900 |
| Silver salmon | | | 89, 670 | 89, 670 |
| *Quilcene, Wash.:* | | | | |
| Chinook salmon | | | 18, 635 | 18, 635 |
| Chum salmon | 1, 369, 000 | 2, 832, 000 | 141, 170 | 4, 342, 170 |
| Silver salmon | | | 124, 495 | 124, 495 |
| Sockeye salmon | | | 41, 520 | 41, 520 |
| Blackspotted trout | | | 90. 545 | 90, 545 |
| Brook trout | | | 53, 000 | 53, 000 |
| Rainbow trout | | | 1, 030 | 1, 030 |
| Steelhead trout | | | 39, 020 | 39, 020 |
| Rochester, Ind.: | | | | |
| Black bass, largemouth | | | 1, 255, 225 | 1, 255, 225 |
| Black bass, smallmouth | | | 37, 070 | 37, 070 |
| Rock bass | | | 37, 600 | 37, 600 |
| Catfish | | | 4, 340 | 4, 340 |
| Crappie | | | 6, 750 | 6, 750 |
| Sunfish | | | 684, 100 | 684 100 |
| Yellow perch | | | 2, 590 | 2, 590 |
| Rochester, N. Y.: | | | | |
| Black bass, largemouth | | | 10, 000 | 10, 000 |
| Black bass, smallmouth | | | 6, 200 | 6, 200 |
| Brook trout | | | 37, 335 | 37, 335 |
| Loch Leven trout | | | 160, 425 | 160, 425 |
| Rainbow trout | | | 97, 040 | 97, 040 |
| *Carpenter's Brook, N. Y.:* | | | | |
| Brook trout | | | 31, 035 | 31, 035 |
| Loch Leven trout | | | 3, 320 | 3, 320 |
| Rainbow trout | | | 30, 515 | 30, 515 |

*Stations and substations operated and the output of each, fiscal year 1939*—Continued

| Stations, substations, and species | Eggs | Fry | Fingerlings | Total |
|---|---|---|---|---|
| Saratoga, Wyo.: | | | | |
| Blackspotted trout | | | 415,830 | 415,830 |
| Brook trout | | | 474,930 | 474,930 |
| Lake trout | | | 14,700 | 14,700 |
| Rainbow trout | | | 268,750 | 268,750 |
| Spearfish, S. Dak.: | | | | |
| Brook trout | | | 117,785 | 117,785 |
| Blackspotted trout | | | 22,000 | 22,000 |
| Loch Leven trout | | | 52,500 | 52,500 |
| Rainbow trout | 58,140 | | 660,660 | 718,800 |
| Springville, Utah: | | | | |
| Black bass, largemouth | | | 1,095 | 1,095 |
| Blackspotted trout | | | 574,720 | 574,720 |
| Brook trout | | | 344,530 | 344,530 |
| Rainbow trout | 100,000 | | 652,595 | 752,595 |
| Sockeye salmon | | | 188,080 | 188,080 |
| Grayling | 275,000 | | | 275,000 |
| *Bear Lake, Utah:* | | | | |
| Blackspotted trout | | | 90,440 | 90,440 |
| Brook trout | | | 173,480 | 173,480 |
| Rainbow trout | | | 79,500 | 79,500 |
| Chum salmon | | | 94,080 | 94,080 |
| Sockeye salmon, landlocked | | | 125,955 | 125,955 |
| Uvalde, Tex.: | | | | |
| Black bass, largemouth | | 393,950 | 357,290 | 751,240 |
| Catfish | | | 1,200 | 1,200 |
| Crappie | | | 240 | 240 |
| Rio Grande perch | | | 162,060 | 162,060 |
| Sunfish | | | 517,505 | 517,505 |
| *Fort Worth, Tex.:* | | | | |
| Black bass, largemouth | | | 74,900 | 74,900 |
| Warmouth bass | | | 1,100 | 1,100 |
| Crappie | | | 7,000 | 7,000 |
| Catfish | | | 2,500 | 2,500 |
| Sunfish | | | 24,350 | 24,350 |
| *San Angelo, Tex.:* | | | | |
| Black bass, largemouth | | | 146,600 | 146,600 |
| Crappie | | | 3,000 | 3,000 |
| Sunfish | | | 120,395 | 120,395 |
| *San Marcos, Tex.:* | | | | |
| Black bass, largemouth | | 285,700 | 161,840 | 447,540 |
| Rock bass | | | 5,300 | 5,300 |
| Catfish | | | 4,900 | 4,900 |
| Crappie | | | 15,550 | 15,550 |
| Rio Grande perch | | | 13,700 | 13,700 |
| Sunfish | | | 92,055 | 92,055 |
| Walhalla, S. C.: | | | | |
| Brook trout | | | 387,605 | 387,605 |
| Rainbow trout | | | 261,970 | 261,970 |
| Welaka, Fla.: | | | | |
| Black bass, largemouth | | 88,000 | 284,920 | 372,920 |
| Sunfish | | | 11,600 | 11,600 |
| White Sulphur Springs, W. Va.: | | | | |
| Black bass, largemouth | | | 2,000 | 2,000 |
| Rock bass | | | 1,000 | 1,000 |
| Brook trout | | | 353,935 | 353,935 |
| Loch Leven trout | | | 16,335 | 16,335 |
| Rainbow trout | 392,000 | | 102,140 | 494,140 |
| Woods Hole, Mass.: | | | | |
| Flatfish | | 568,530,000 | | 568,530,000 |
| Mackerel | | 11,060,000 | | 11,060,000 |
| Wytheville, Va.: | | | | |
| Black bass, smallmouth | | | 3,710 | 3,710 |
| Rock bass | | | 14,500 | 14,500 |
| Brook trout | | | 32,190 | 32,190 |
| Rainbow trout | 708,000 | | 461,575 | 1,169,575 |
| Pike perch | | 400,000 | | 400,000 |
| Sunfish | | | 33,050 | 33,050 |
| *Harrison Lake, Va.:* | | | | |
| Black bass, largemouth | | 83,500 | 4,670 | 88,170 |
| Crappie | | | 5,485 | 5,485 |
| Shad | | 5,174,220 | | 5,174,220 |
| Sunfish | | | 64,370 | 64,370 |
| *Norris, Tenn.:* | | | | |
| Black bass, largemouth | | 63,000 | 4,225 | 67,225 |
| Kentucky bass | | 2,000 | 1,100 | 3,100 |
| Pike perch | | 450,000 | | 450,000 |
| Rainbow trout | | | 250 | 250 |
| Sunfish | | | 2,500 | 2,500 |
| *Smokemont, N. C.:* | | | | |
| Brook trout | | | 142,005 | 142,005 |
| Rainbow trout | | | 184,545 | 184,545 |

*Stations and substations operated and the output of each, fiscal year 1939*—Continued

| Stations, substations, and species | Eggs | Fry | Fingerlings | Total |
|---|---|---|---|---|
| Yellowstone Park, Wyo.: | | | | |
| Blackspotted trout | 26, 258, 290 | | 5, 895, 445 | 32, 153, 735 |
| Grayling | 1, 524, 800 | 4, 195, 270 | | 5, 720, 070 |
| *Jackson, Wyo.:* | | | | |
| Blackspotted trout | 100, 000 | 469, 620 | 101, 020 | 670, 640 |
| Brook trout | | | 13, 200 | 13, 200 |
| Lake trout | | | 7, 500 | 7, 500 |
| Rainbow trout | | | 70, 310 | 70, 310 |
| Grayling | | 101, 480 | | 101, 480 |
| Total | 5, 824, 802, 070 | 2, 115, 405, 660 | 84, 332, 955 | 8, 024, 540, 685 |

## EGG COLLECTIONS

In spite of a slight reduction in hatchery output for 1939 the collections of eggs for that period exceeded the 1938 figure by some 355 million. This is explained in part by the fact that a considerable number of fingerlings, particularly of salmon, are being held for distribution during the succeeding fiscal year, and the 1939 distribution was in part achieved from the 1938 egg collections. The greatest increase was in the collection of cod eggs, which were increased by approximately 825 million, and in the pike perch work, where the increase was about 710 million. Mortalities in hatching these eggs may vary widely, with the consequent possibility of a reduction in the production of fry in spite of an increased take of eggs.

*Comparison of egg collections, fiscal years 1938 and 1939*

| Species | 1938 | 1939 | Species | 1938 | 1939 |
|---|---|---|---|---|---|
| Shad | 27, 523, 000 | 48, 257, 000 | Yellow perch | 331, 425, 000 | 301, 668, 000 |
| Whitefish | 123, 711, 000 | 52, 464, 000 | White perch | 6, 400, 000 | 8, 300, 000 |
| Chinook salmon | 41, 336, 400 | 63, 124, 000 | Cod | 2, 372, 773, 100 | 3, 197, 555, 700 |
| Chum salmon | 16, 187, 000 | 11, 196, 800 | Haddock | 1, 037, 330, 500 | 1, 178, 993, 700 |
| Silver salmon | 1, 300, 000 | 3, 080, 000 | Pollock | 2, 116, 821, 200 | 1, 560, 497, 100 |
| Sockeye salmon | 3, 180, 000 | 2, 969, 000 | Flatfish (flounder) | 1, 402, 749, 000 | 1, 318, 397, 100 |
| Humpback salmon | 5, 111, 000 | | Mackerel | | 11, 060, 000 |
| Rainbow trout | 28, 241, 300 | 30, 155, 900 | Lake herring | 2, 200, 000 | 5, 325, 000 |
| Blackspotted trout | 31, 048, 500 | 42, 898, 600 | Glut herring | 2, 960, 000 | 8, 140, 000 |
| Loch Leven trout | 1, 777, 500 | 899, 500 | Striped bass | 646, 000 | 3, 413, 000 |
| Lake trout | 1, 536, 900 | 2, 852, 000 | Carp | 329, 200, 000 | |
| Brook trout | 31, 061, 800 | 11, 576, 700 | Buffalofish | 387, 445, 000 | 78, 681, 500 |
| Steelhead trout | 1, 588, 800 | 3, 386, 900 | Lobster | 8, 444, 000 | 12, 991, 600 |
| Grayling | 5, 837, 000 | 5, 117, 600 | | | |
| Golden trout | | 18, 200 | Total | 8, 574, 205, 000 | 8, 929, 774, 000 |
| Pike perch | 256, 371, 000 | 966, 755, 100 | | | |

## NOTES ON OPERATIONS

### COMMERCIAL SPECIES

*Pacific salmon.*—It is recognized that the run of chinook salmon, which is the most valuable species of the Pacific salmon in the Columbia and Sacramento Rivers, is facing a very serious situation because of the construction of dams on these rivers. Millions of dollars are being spent by the Pacific Coast States and the Federal Government to maintain the run of this species. During the year 1939 the output of chinook salmon fingerlings from the Bureau's hatcheries was approximately 14 million over that of 1938.

In the Puget Sound territory, the Birdsview (Wash.) station handled fewer eggs and fish than during the previous season but reared the greater percentage of its output to a larger size before releasing them. This recession was largely due to the fact that no humpback salmon eggs were taken, whereas last year 4,305,000 were collected during the largest run of this species in the Skagit River in 25 years. The output comprised 4 species of trout and 3 varieties of Pacific salmon. No chum salmon were propagated. Twenty small concrete rearing ponds which had been in use since the origin of the station were dismantled, and an entire new concrete pond system consisting of 8 ponds 13½ feet wide by 56 feet long was constructed. The capacity of each pond is about 250,000 2- to 3-inch fish. Cottage No. 1 was renovated and all other buildings repaired and painted. A new machinery shed 24 by 60 feet, with open front, was constructed for use in storing station machinery and equipment.

The total number of eggs collected by the Clackamas (Oreg.) station and its auxiliaries amounted to approximately 22,700,000, as compared with 20,000,000 during the past year—an increase of nearly 12 percent. This total was due to the abnormally large collections of fall chinook salmon eggs at the Battle Creek and Mill Creek (Calif.) substations. The collection of spring chinook salmon eggs was below normal at both the Clackamas and Butte Falls units. The low collection of eggs at the latter point is ascribed to the late installation of the headrack across Rogue River, which was due to the late runoff of snow water from the upper sources of this stream. A new permanent rack and trap in Butte Creek yielded more than 1½ million steelhead trout eggs. However, the collection of silver salmon eggs from this body of water proved a complete failure. The Clackamas station supplemented its salmon work by handling brook and rainbow trout. The pond system at the Delph Creek rearing station was repaired, rearranged and enlarged. Construction of a frame hatchery building was started. At Clackamas the old combination workshop and dwelling was remodeled. A laboratory building, 32 by 45 feet, for use by the Division of Scientific Inquiry, was practically completed. A chlorinating system was installed for the purpose of sterilizing the water supply before it enters the two reservoirs with the expectation that previous heavy mortality of fish would be eliminated. The two residences under construction at the Butte Falls station were completed during the year.

The development of the hatchery at Carson, Wash., was continued under the auspices of the P. W. A. and W. P. A. and with the cooperation of the United States Forest Service. This unit does not as yet have a pond system of sufficient capacity to rear its fish to a large size before releasing them. Plans have been drawn up for increasing the pond space. Chinook salmon and brook, rainbow, and black-spotted trout were handled during the year. All of the trout were assigned to the Forest Service for the stocking of waters under the control of that agency.

Due to the development of the Bonneville Dam on the Columbia River, the Little White Salmon and Big White Salmon substations had to locate new seining grounds and clear the debris from such areas in order to facilitate the capturing of adult salmon. Nevertheless, the former station collected 20,443,000 chinook salmon eggs, which is a normal take, and the latter unit secured 18,250,000 eggs of this species, which was its largest collection since the season of 1932. While the Little White Salmon station was solely engaged in the propagation of chinook salmon, the Big White Salmon station augmented its salmon work by handling brook and rainbow trout. New buildings were constructed at both points and numerous repairs made to old structures.

The Quinault (Wash.) station collected its quota of sockeye salmon eggs for hatching, which is 2,000,000, and secured an additional 200,000 for transfer to the Washington State Fisheries Department. This unit also handled chinook and silver salmon and steelhead, rainbow, brook, and blackspotted trout. The eggs for all species propagated, except the latter two, were collected locally. Approximately 3,350,000 eggs were handled and the resultant fish were all reared to fingerlings before being liberated. The Humptulips trap, which is located on the West Fork of Humptulips River, was completed and operated during the chinook salmon and steelhead trout runs. Other construction work consisted of the following: Food room rebuilt, hatchery building reroofed, new office in hatchery constructed, large cold-storage room built, new concrete walks and stairways poured, and grounds landscaped.

The major fish-cultural activity at the Duckabush and Quilcene (Wash.) substations was the propagation of chum salmon. Due to stream-improvement work at the mouth of the Big Quilcene River at the height of the spawning season of the early run, the latter station was unable to secure any chum eggs from this source. However, the Duckabush unit collected 2,870,000 eggs from the early run in Duckabush River and both stations secured from the late run in the Walcott slough field more than 8,000,000 eggs. The spawned-out adults were transferred to the Quilcene dehydrating plant, and the dry salmon-meal was utilized at a number of trout hatcheries for fish food. The Quilcene hatchery supplemented its salmon work by concentrating on the production of trout fingerlings during the summer months for the stocking of local waters. At this station a new building was constructed and the necessary troughs and equipment were installed for conducting pathological studies.

## MARINE SPECIES

The Boothbay Harbor (Maine) station collected 1,419,860,000 cod, 517,305,000 pollock, and 417,832,000 haddock eggs which, after being fertilized, were liberated upon the natural spawning grounds of the respective species. From 670,000,000 flounder eggs incubated in the hatchery, a hatch of 90 percent was attained. The number of eggs of this species handled was in excess of last season's by 76,000,000. In cooperation with the Sea and Shore Fisheries Commission of Maine, lobster culture was continued. Near the Bureau's hatchery this agency constructed a rearing station that is equipped with 500 lobster-rearing compartments. It is believed that when all details have been completed this unit will have facilities for rearing 1,000,000 lobsters to the fourth larval stage. There were on hand at the beginning of the year 327,400 lobster fry from which a number of fourth-stage lobsters were raised and liberated at different points along the coast of Maine. During the spring of 1939, 3,915 adult egg-bearing lobsters were secured. Some of these adults were placed in cod boxes which had been rearranged in order that the young lobsters could hatch normally. Eggs were stripped from the others and placed in McDonald hatching jars for incubation. On June 30, there had been hatched 3,899,000 lobster fry, of which 1,045,000 were placed in the rearing station, the remainder being liberated.

On September 21, 1938, the Woods Hole (Mass.) station was struck by a hurricane and tidal wave which destroyed windows, lattice work, slate shingles on the roofs, docks, sea wall, salt-water suction pipe line, and other property. The wooden portion of the east dock and sea wall was razed. Considerable time and funds will be required to rehabilitate this unit. The new suction line has been installed and other necessary repairs were made in order that the station could carry on its flounder work. Approximately 633,987,000 flounder eggs were collected and 568,530,000 fry were hatched and distributed. Approximately 50 percent of these fry were liberated in the coastal waters of Massachusetts—the remainder being planted along the coasts of New Jersey and Rhode Island, and in Long Island Sound and Narragansett Bay. Through the cooperation of the local commercial fishermen, there were collected 13,484,000 mackerel eggs from which 11,060,000 fry were hatched and liberated in Vineyard Sound and Buzzards Bay.

The fish-cultural activities at the Gloucester (Mass.) station consisted of the propagation of pollock, flounder, haddock, cod, and lobster. There was a noticeable decrease in the production of the three former species, whereas there was a slight increase in the number of cod handled. Several spawn-takers were assigned to commercial fishing vessels for the purpose of collecting pollock, haddock, and cod eggs, a large percentage of which, after fertilization, were planted on the spawning grounds. The hatchery was also operated to capacity when eggs were obtainable. The total number of eggs collected was slightly in excess of 3½ billion. The lobster-cultural work was carried on in cooperation with the Massachusetts Department of Conservation, the same as last year. Four hundred and ten seed lobsters produced 3,221,600 eggs which were incubated in McDonald hatching jars. Due to insufficient feeding equipment, it was necessary to liberate the greater percentage of the young lobsters in the third larval stage. Under the auspices of the P. W. A. and W. P. A., the buildings and equipment at this point were reconditioned and overhauled. Major changes consisted of the following: 15,000-gallon storage tank constructed, main hatchery building, storehouse and workshops reroofed, extension constructed on southwest side of boiler room to provide additional space for new boiler, new boiler installed as a replacement for the obsolete boiler, wharf repaired, new concrete floor poured in hatchery building, and all buildings given one coat of paint.

### GREAT LAKES SPECIES

As Michigan maintains a closed season during the height of the spawning period for whitefish and lake trout, the collection of eggs of these species by the Duluth (Minn.) station was restricted to collecting fields in that section of Lake Superior not controlled by the State of Michigan. All lake trout and whitefish eggs obtained in Michigan waters were taken either before or after the closed season, and were of an inferior quality, with a resultant poor hatch. About 5,325,000 lake herring eggs were obtained from commercial fishermen from which

3,000,000 fry were liberated in Minnesota waters. The collecting of pike perch eggs was carried on in cooperation with the United States Forest Service. From 21,500,000 eggs of this species collected, 13,640,000 fry were distributed. Brook, rainbow, and brown trout eggs were hatched at this station for the stocking of local trout waters and for the Cascade rearing ponds in the Superior National Forest. The low temperature of the hatchery water supply induced high mortality among the trout eggs. Repairs and improvements were made to buildings and equipment by P. W. A. and W. P. A. workers.

Because of the high water temperatures which existed at the normal spawning period, the whitefish spawning season on Lake Erie in the vicinity of the Put in Bay (Ohio) hatchery was unusually late. However, more than 48,200,000 whitefish eggs were collected and placed in the hatchery. On December 29 the water-supply line to the hatchery froze, necessitating the planting of all eggs in the lake. There were 943,340,000 pike perch eggs collected from the 6 fields worked—one of the largest collections in the history of this station. The most productive field was at Port Clinton, where more than 500,000,000 eggs were secured. The propagation of both species was carried on in cooperation with the Ohio Conservation Division.

Due to the shortage of funds, the Cape Vincent (N. Y.) station was unable to send spawn-takers into the field. Therefore, it was necessary to depend upon the local commercial fishermen for the supply of lake trout and whitefish eggs. There were 1,108,800 lake trout eggs handled, while 70,000 whitefish eggs of poor quality were received. The major activities are the propagation of game fish, particularly smallmouth black bass, and the operation of substations for the rearing of trout. This phase of the work is discussed elsewhere in this report. At the Swanton (Vt.) substation all buildings were reroofed and painted, but there were no fish-cultural activities carried on. This unit has, in previous years, handled pike perch and yellow perch.

## ANADROMOUS SPECIES, ATLANTIC COAST

The Edenton (N. C.) hatchery surpassed its 1938 collection of shad eggs by taking 11,134,000 from which 7,134,000 fry were hatched. All of these fry were planted in Albemarle Sound and its tributaries, with the exception of 500,000 which were planted in hatchery ponds for investigation and study. A culture of daphnia was maintained in the ponds until the shad were seen swimming along the shoreline, at which time artificial food was given them. The food consisted largely of ground fresh fish and shrimp meal. A new field was located on the other side of the sound near Mackeys, from which 8,300,000 white perch eggs were collected. A limited number of yellow-perch eggs were secured. The Edenton station propagates pondfish for the stocking of inland waters, supplementing its work with the commercial species. This unit was favored with W. P. A. and P. W. A. projects, which resulted in the completion of several ponds, a residence and other improvements. The Weldon (N. C.) substation was operated in cooperation with the Conservation Department of North Carolina for the hatching of striped bass, and 3,413,000 eggs of this species were collected.

The Orangeburg (S. C.) station operated an auxiliary hatchery on the Edisto River near Jacksonboro for the propagation of shad.

There were 1,876,000 eggs collected, from which 1,534,000 fry were liberated in the Edisto and Ashepoo Rivers. While this number does not equal the records of previous seasons, it does represent an increase of one-half million fry over last year.

At the Fort Belvoir (Va.) hatchery, located on the Potomac River, the main fish-cultural activities were the collecting and hatching of shad and yellow-perch eggs. The collection of shad eggs exceeded that of last season by more than 10 million, while there was a slight recession in the number of yellow-perch eggs secured. A one and one-half story, five-room, brick-veneer residence was constructed, and the marine railway and carriages were rebuilt.

### GAME-FISH PROPAGATION

One would consider practically the entire output of the Bureau's hatcheries as coming within this category, since all species propagated, except lobster, whitefish, herring and shad, are at some time or place sought by sportsmen.

Never in the history of the Bureau have the demands been so great for game fish. This may be ascribed in part to the large number of reservoirs constructed by the Department of Agriculture in its soil-conservation program, the impounding of large bodies of water by hydro-electric projects, the flooding of areas by the Bureau of Biological Survey to create migratory bird refugees, and to the prosecuting of stocking programs formulated by various Federal and State agencies. However, the innate popularity of angling among all classes is probably the most comprehensive explanation for the demand.

The following data cover the activities of the stations handling the families Centrarchidae and Cichlidae and the species of the Salmonidae found largely in inland waters.

### ROCKY MOUNTAIN TERRITORY

Due to adverse weather during the spawning season, and water shortage throughout the summer, the output of pondfish from the Dexter (N. Mex.) station was below normal. Approximately 121,000 of the fish distributed ranged from 5 inches in length to legal size. In cooperation with the New Mexico Department of Game and Fish, a stocking program was formulated for the waters of that State. This program was adhered to as much as possible, although a portion of Dexter's production was utilized for the stocking of Arizona, Colorado, and Texas waters Heretofore, predatory birds have devoured large numbers of this unit's brood stock each winter and a network of wires was attached to cables over some of the ponds in order to frighten such visitors. A concrete cistern of 30,000 gallons capacity, for storing water for domestic use, was constructed. The metal fish tanks were removed from the holding house and replaced with 14 concrete tanks. All station buildings were repaired and painted and a large cactus garden was planted near the entrance to the station.

The output of fish from the Santa Rosa (N. Mex.) substation was practically the same as that of the previous season. A number of choice smallmouth black bass fingerlings were saved out of last year's hatch, and it is anticipated that the 1940 output of this species will be greatly increased. The number of food organisms produced in the ponds appeared to justify the expense involved in fertilizing them with a mixture of sheep manure, superphosphate, and cottonseed meal. This unit's pond system was increased by 6 ponds during the year.

At the Elephant Butte (N. Mex.) station all buildings and ponds were completed by the Reclamation Service and placed in operation. From 13.4 acres of water more than ½ million fingerling pondfish were produced, of which 373,750 were largemouth black bass. A stock of crappie, which are reported to have reached a size of 3 pounds in the warmer waters of the Pecos Valley watershed, was secured for the purpose of introducing a large-size strain of this species into the waters of the Rio Grande.

In the Utah field the Springville station distributed 1¾ million fingerling fish and shipped 980,000 trout eggs to other hatcheries. The production of largemouth black bass was negligible. Experiments were conducted to determine the effect of diet upon the fertility of rainbow trout eggs. The old wood-pipe hatchery-water supply line was replaced with a 10-inch asbestos-wrapped 12-gage spiral-welded steel line.

At the Bear Lake (Utah) substation 5 species of trout and chum salmon were handled. This unit collected 1,174,000 eggs from local trap sites and received 657,820 eggs from other stations. In addition to the construction of a new residence, all buildings were painted by W. P. A. and P. W. A. employees.

All buildings and ponds were completed at the Las Vegas (Nev.) unit. During the early spring this station secured an ample stock of brood fish from which 80,000 fingerling black bass were planted in Lake Mead prior to the close of the year.

On September 11, 1938, the Bureau took charge of the Clark Fork (Idaho) hatchery, which was constructed as a W. P. A. project sponsored by the Idaho Fish and Game Department on land donated by the Bonner County Sportsmen's Association. Gratifying results were obtained from the eggs handled and it was possible to liberate more than ½ million fingerling silver and blackspotted trout during the latter part of the year.

In the Colorado territory the Leadville station continued to cooperate with local parties in the collecting of trout eggs. The Bureau received several million eggs from such sources at a nominal cost, thereby eliminating the necessity of maintaining a brood stock at this unit. Several thousand trout were transferred to the Crystal Lake Nursery to be reared to a larger size before liberation. There were 4,300,000 rainbow eggs collected from Eagle Nest Lake during April and the early part of May. More than 1 million of these eggs were assigned to the New Mexico Department of Game and Fish for hatching and subsequent planting in the waters of the northern part of the State. The hatchery building and 2 cottages at Leadville were reroofed and a two-car garage was built. A new cottage was constructed at Turquoise Lake from lumber milled by W. P. A. labor.

An average production of fingerling trout was obtained at the Creede (Colo.) substation. Due to the scarcity of spawners, the collection of brook and rainbow trout eggs from Lake San Cristobal was materially below that of 1938. However, the eggs obtained were of very high quality, eyeing up to 98 and 99 percent respectively. Three old concrete ponds were dismantled and 4 new concrete ponds were constructed in the same area. A two-car garage was built and the river bank in front of the hatchery building was riprapped with rock.

In the Idaho field the number of eggs taken from the brood stock at the Hagerman station was disappointing, due to the large number of barren females. The reason for this large percentage of barren females is not definitely known, but it is ascribed to diet. Experiments are being conducted to ascertain if this assumption is correct. Approximately 1 million large fingerling trout were produced. The rearing-pond system was greatly increased during the year by W. P. A. and P. W. A. employees.

The substation at Salmon, Idaho, which heretofore had been operated on a seasonal basis, was operated during the entire year in cooperation with the Idaho Fish and Game Department primarily for handling the rainbow eggs collected at Williams Lake and other local waters. Extensive repairs and improvements, including the rearranging of the hatching and rearing equipment in the hatchery, were made during the winter.

The distribution of rainbow trout from the Bozeman (Mont.) station was somewhat limited, due to the high mortality among this species during the latter part of the previous year. Normal success was attained with the other species of trout and grayling handled. Elk carcasses received from Yellowstone Park were utilized for fish food. This station was the beneficiary of P. W. A., W. P. A., and N. Y. A. projects which made possible extensive repairs and improvements to buildings, grounds, and equipment.

The Glacier Park (Mont.) substation received 2,501,480 black-spotted trout and 400,000 rainbow trout eggs from the Yellowstone Park unit and planted the resultant fish in the advanced fry stage in Park waters. The water-temperature range is too great for successful hatchery operation at this point. In view of this and the need for a new and improved hatchery for producing larger fish for the stocking of waters of the Glacier National Park, an alternative site was located 2 miles west of Creston. This unit, as planned, will consist of a 48-trough hatchery building of frame construction, containing an office, laboratory, 2 lavatories, and a storage room. There will be 12 concrete raceway ponds, each 107 by 10 feet; 10 Foster-Lucas concrete ponds of oval shape, each 56 by 13½ feet; 1 utility building and several residences. The grounds are to be landscaped and provision will be made for a picnic area which will be supervised by the Park Service. The construction of this hatchery was started on March 1, 1939, under the auspices of the W. P. A., P. W. A., and N. P. S., with the Bureau furnishing technical advice. Due to adverse weather conditions and unforeseen constructional difficulties the work is somewhat behind schedule, but it is anticipated that this station will be ready for operation in the spring of 1940.

The production of the Ennis (Mont.) substation was largely utilized in the restocking of waters of the Madison Valley watershed in an effort to reestablish the excellent sport fishing of the past years. The scarcity of adult rainbow and Loch Leven trout ascending the Madison River during the spawning season was more acute than ever. Consequently, this station had to rely on other sources for practically all of the eggs of these species. The major construction activities were erection of a four-room cottage, the extension of the water-supply main, installation of a hydroelectric turbine and generator unit, the installation of a steam-heating plant in the hatchery building, and the fencing of station grounds.

Although the bass production was small, the total output of the 4 species of fingerling fish handled at the Miles City (Mont.) substation was larger than during either of the 2 preceding years. The small production was attributed to an inadequate supply of mature brood fish and the delay in harvesting, which was caused by very hot weather prevailing after a large amount of the water had been drawn from the large lake. However, the large size of the fingerling bass collected compensated for the small number taken. The large number of reservoirs built by the Farm Security Administration in this section of the country is creating a bigger demand for pondfishes, especially catfish, and special effort is being made to increase the production of this species. From the Nebraska Conservation Commission 1,900 adults, 10,000 fry, and 40,000 channel catfish eggs, green and eyed, were received in exchange for grayling eggs.

Inasmuch as the work at the Yellowstone Park station covered the midsummer months extending into parts of 2 fiscal years, the data furnished here cover the season of 1938. Because of high-water conditions, much difficulty was experienced in maintaining the fish traps. For instance, the trap in Pelican Creek, which was by far the largest producing trap in 1937, could not be operated from May 25 to June 10 because of extremely high water. Notwithstanding these conditions, the take of eggs was more than 37 million, which is considered an average collection although it was approximately 10 million less than during the season of 1937. There was an increase in the number of fish reported as being taken from the waters of the Yellowstone Park this year, while the number of Park visitors was slightly less than last year. In 1938 there were 163,859 fish reported at the checking stations, while the number reported in 1937 was 135,654.

The Jackson Hole (Wyo.) substation, which was operated on a seasonal basis, produced approximately 870,000 blackspotted, lake, rainbow, and brook trout, and grayling for stocking waters of the Grand Teton National Park and the Teton National Forest. A C. C. C. project permitted development of a number of improvements, including the repairing of 4 circular concrete ponds, the construction of 2 rectangular ponds, and the landscaping of station grounds.

A new three-stall garage was constructed and all buildings were painted at the Saratoga (Wyo.) station. The pond system was enlarged by the construction of 2 concrete ponds 100 by 10 feet, 2 concrete ponds 60 by 6 feet, and one dirt pond with concrete ends. Fish-cultural work was carried on along usual lines and normal success was attained in the production and distribution of trout fingerlings.

The Baker Lake (Wash.) station, which was formerly used for the propagation of salmon, was remodeled for the purpose of rearing trout to stock Baker Lake and tributary waters. During the early part of the year C. C. C. enrollees from a local camp assisted in the laying of pipe lines, rebuilding the intake dam, etc. This unit was operated on a fish-cultural basis only from June 1 to June 30. The fish which were received by transfer from other stations are being reared to a larger size before planting. Consequently, no distribution was made from this hatchery during the fiscal year.

From the 12 circular rearing ponds operated at the Spokane, (Wash.) substation, approximately 230,000 large fingerling brook, rainbow, and blackspotted trout were distributed. All except 6,000 of these fish were planted by the Conservation Departments of Washington and Idaho. A four-room, frame, one-story cottage, with concrete basement, was constructed. A concrete foundation for a hatchery building 38 by 54 feet was poured and fill made within the foundation walls preparatory to the laying of a concrete floor. At present, this station utilizes trough space in the local State hatchery for incubating its trout eggs.

As there was no stock of eggs or fish on hand at the Mount Rainier (Wash.) substation at the beginning of the year, the entire unit, including water-supply lines, ponds, troughs, feeding tanks, and all fish-cultural tools and appliances, was thoroughly sterilized with calcium hypochlorite to eradicate fish parasites and diseases which had prevailed. When the shipments of eggs were received, they were sterilized by submerging them in a 1:2,000 solution of acriflavine for 20 minutes before they were placed in the hatching troughs. As a result of this precaution, the stock of fish at this hatchery remained free of all diseases during the year. This station collected rainbow trout eggs from Mowich Lake and received approximately 850,000 eggs of rainbow, brook, and blackspotted trout from other points. The greater percentage of the resultant fish were planted in the waters of the Mount Rainier National Park and the Snoqualmie National Forest.

The Spearfish (S. Dak.) station installed 4-foot red and green Neon lights under the surface of the water in some of the trout ponds to attract insects for fish food. One cottage was constructed and many repairs and improvements were made to the buildings, equipment, ponds, and water-supply system. The egg-take from the station brood stock was only about 50 percent of that of the past season, due to the large number of barren females among the rainbows and the heavy mortality of the Loch Leven stock prior to the spawning season. The small laboratory continued to be a very important unit at this station. Through weekly microscopic examination of all lots of fish many diseases are diagnosed and checked before they cause serious trouble.

## NEW ENGLAND TROUT STATIONS

Owing to the appearance of furunculosis the latter part of last year, and the consequent disposition and destruction of all fish on hand, fish-cultural operations at the National Forest (N. H.) station were suspended until the receipt of eggs during the fall of 1938. The States of Vermont and New Hampshire furnished 1 million brook trout eggs with the understanding that the Bureau would provide food equal to their value. To supplement these eggs, approximately 1½ million were collected from yearling and 2-year-old fish held in the Whitefield rearing ponds of the New Hampshire Fish and Game Department. Repairs and improvements were prosecuted by W. P. A. and P. W. A. workers. The pond system was enlarged by the construction of additional raceways 3 feet wide by 165 feet long, in three equal sections with falls between. These ponds are arranged in such a way that four different water supplies may be utilized if necessary.

The hurricane which raged through the New England States on September 21 did little damage to the St. Johnsbury (Vt.) station other than blowing down some of the trees in the pine plantation. With the assistance of the W. P. A. and P. W. A. much valuable work was accomplished, not only in repairs to ponds, buildings, drainage lines, water supply, etc., but by the addition of several new raceways. A concrete intake dam in Sleepers River was constructed to replace an obsolete plank structure, thereby assuring a constant water supply at all times. As usual, the major fish-cultural activity was the hatching of approximately 1½ million brook trout eggs. At the beginning of the year the entire stock of brown trout and landlocked salmon fingerlings was wiped out by the parasite *ichthyophthirius multifilis*. The fish-cultural work of this station is carried on in cooperation with the Fish and Game Service of Vermont.

The Pittsford (Vt.) station continued its experiments in selective breeding of trout and conducted various other investigations. This year the adults yielded eggs at the rate of 1,424 per pound of fish. As the average fish-culturist recognizes 1,000 eggs per pound of trout as the normal production, the effect of selective breeding is obvious. This station was favored with W. P. A. and P. W. A. projects for the repairing and improving of buildings, equipment, and roadways.

The Craig Brook (Maine) hatchery collected 4,300,000 brook trout eggs, of which number approximately 2½ million were shipped to other Bureau stations. Shipments of rainbow and lake trout eggs were received, from which several thousand fingerlings were distributed. In accordance with an agreement between the National Park Service and the Bureau, the Acadia National Park was allotted 185,000 large fingerling brook trout for the stocking of waters under its control. Repairs and improvements were made to buildings, ponds, drainage and supply lines, roadways, etc., by P. W. A. and W. P. A. workers.

In order to facilitate the repairing of old ponds and enlarging the pond system, the Hartsville (Mass.) hatchery disposed of its brood stock of trout. Consequently no eggs were taken at this point. Approximately 400,000 brook and 27,000 rainbow trout fingerlings, ranging in size from 1½ to 4½ inches, were distributed. In cooperation with the State of Connecticut, 773,000 smallmouth black bass fry were collected from Wangum Lake; one-half of which were assigned to the State of Connecticut.

As the Nashua (N. H.) station was struck by a hurricane in September, a large amount of time has been spent by the personnel in rehabilitating it. In addition to this work, a garage and 4 concrete ponds were constructed. This unit suffered high losses among all species of fingerling and yearling trout the latter part of the year.

### COMBINATION TROUT AND PONDFISH STATIONS

Although most of the establishments in this category have heretofore been primarily concerned with the propagation of trout, several of them have enlarged their facilities for the propagation of warm-water species. In some cases the production of spiny-rayed fishes is almost equal to the output of some of the smaller units which are exclusively engaged in the handling of pondfishes.

At the Lamar (Pa.) station the hatchery building was completed during October and the necessary equipment placed therein, enabling this unit to incubate trout eggs. More than 1 million brook, brown, and rainbow eggs were hatched. In addition to the furnishing of fish for rearing at the Ogletown substation, several thousand trout were allotted to conservation clubs to stock their nursery ponds. Nine ponds, ranging in size from ½ to 2 acres in area, for the propagation of warm-water fishes, were completed in time to be stocked with brood fish during the spring. C. C. C. enrollees assisted in the above construction work as well as in the landscaping of grounds and the building of roads.

The Northville (Mich.) station's combined output of trout and pondfishes was in excess of one million. Approximately 660,000 trout were delivered to 5 cooperative feeding stations, 2 of which are within the boundaries of National Forests. Several thousand trout were consigned to the conservation departments of Indiana and Ohio for the stocking of suitable waters in their respective States. New outlet kettles were constructed in the 9 warm-water fishponds, and the ponds were graded. The hatchery water supply was materially increased by the construction of a concrete retaining wall across the southwest side of the spring pond. After repairs and alterations were made to all station buildings, they were painted.

The Powder Mill Park (N. Y.) hatchery, which is operated in cooperation with the Monroe County Park officials, reared several thousand trout to legal size before releasing them. This station also handled smallmouth and largemouth black bass for the stocking of Monroe County waters.

The 65,000 trout liberated by the Carpenter's Brook (N. Y.) station, which is operated in cooperation with Onondaga County sportsmen, were all 5 to 7 inches in length. At the close of the year this unit was feeding more than 200,000 fingerling and yearling brook, rainbow, brown, and lake trout. No output of smallmouth black bass was recorded, as the ponds to be utilized for this species were not completed until during the fall months. Brood stock of this species was collected and placed in the ponds this spring.

The Manchester (Iowa) station collected 2,992,000 rainbow trout eggs of which 89 percent were eyed. All of these eggs, with the exception of approximately 200,000, were shipped to other Bureau and State hatcheries. The production of smallmouth black bass was negligible, which was ascribed to the stocking of the rearing ponds with forage minnows previous to the introduction of bass fry. A new dwelling was constructed and residence No. 3 was moved to a new location and provided with a basement. Two 25-foot circular concrete ponds were built and a new main-supply pipe line was laid from the spring to the hatchery.

In an effort to step up the production of warm-water fish at the Flintville (Tenn.) station, 5 new ponds were excavated. Four of these are approximately 1 acre in area, the other being 2 acres. This brings the number of ponds up to 16, with a total area of 17¼ acres. The reservoir from which these ponds receive their water supply was enlarged. From 250,000 eyed rainbow eggs received by transfer, sufficient fish were produced to meet the requirements for this species in that territory.

The most outstanding feature of the fish-cultural work at the Erwin (Tenn.) unit was the production of more than 1,000,000 pondfish. The output of trout was on a level with that of last year. A new residence was constructed and the pond system enlarged.

Although the total number of rainbow trout eggs collected at the Neosho (Mo.) station was approximately 570,000 less than last year, the number shipped, due to the superior vitality of the eggs, nearly equaled that of last season. The selected brood stock of rainbow trout produced 1,305 eggs per pound of fish. Due to favorable weather during the pondfish spawning season, the output of warm-water species was the largest in the history of the station. Two rectangular trout ponds east of the hatchery building were razed and replaced by 3 circular concrete ponds. A concrete roadway was built and considerable landscaping was accomplished by W. P. A. laborers.

At the Bourbon (Mo.) substation, which is operated on a cooperative basis for the sole purpose of producing rainbow trout eggs, there was a material increase in the yield.

The collection of rainbow trout eggs from the Wytheville (Va.) station's brood stock amounted to 2,152,000 green eggs, which was slightly less than the previous season when 2,237,000 were collected. Approximately 1,133,000 of these eggs were shipped to other Federal and State hatcheries. The production of brook trout was the lowest in recent years, due to a gill infection which practically wiped out this species. The smallmouth black bass yield was also negligible, due to sudden changes in the temperature during the spawning season. The output of bream and rock bass was normal. The fry resulting from the pike perch eggs received from the Put in Bay (Ohio) unit were liberated in New River. Both hatchery buildings were reroofed and approximately 3,000 feet of pipe were laid to the ponds which are utilized for propagating spiny-rayed fishes. A new six-car garage was constructed, and eight brood trout ponds were rebuilt.

The inferior quality of the rainbow and Loch Leven trout eggs collected at the White Sulphur Springs (W. Va.) hatchery was ascribed to the food fed the brood stock. Due to the rebuilding of ponds utilized for the propagation of warm-water fishes, the output of bass was insufficient to meet the demands in that locality. The painting of all buildings except the work shop was completed. A number of new troughs were constructed and installed in the hatchery building. At the close of the year the spring pond and supply ditch were being walled up with stone, and the surrounding grounds landscaped.

At the Leetown (W. Va.) station results in trout-cultural work this year were gratifying, both as to the size and numbers of fish produced. A total of 625,735 fingerling brook, brown, and rainbow trout, of which number approximately 70,000 were in excess of 5 inches in length, were distributed. However, the percentage of hatch obtained from the 3,244,000 trout eggs collected from the station's brood stock was very low. Several thousand trout were assigned to the Monongahela and George Washington National Forests for the stocking of waters within their boundaries. Experiments in the feeding of fish meal, cod liver oil, and kelp meal to trout were carried on in order to further test their value as fish food. Other experiments were made to determine the effects of over- and underfeeding of trout. The production of spiny-rayed fishes was quadruple that of last season. The experiments in the stocking of warm-water rearing ponds with black-head minnows were continued for the purpose of determining how many forage minnows should be stocked per acre of water, and the time of year that they should be introduced into the rearing ponds. Three new residences were completed, and a sewerage system, which is for the combined use of the residences and the new dormitory, was put into operation. Eleven ponds, 500 feet long by 50 feet wide, and a series of 15 small ponds, none of which was in excess of 150 feet in length, were excavated and part of them were placed in operation. A new 11-car garage with an oil-drain pit was built and a cold-storage room with a quick freeze compartment was constructed as an addition to the old garage building. In addition to the above construction work, pond outlet kettles were poured, drainage and supply lines were laid, old buildings were repaired and painted, and considerable landscaping was accomplished.

The output of trout from the Cape Vincent (N. Y.) station and its auxiliaries at Cortland, Watertown, and Barneveld was in excess of 1,500,000. Although the production of smallmouth black bass at Cape Vincent was 92,000, this number was inadequate to meet the demands in that locality. In order to increase the output of this species, additional ponds are being constructed. At the close of the year four were nearing completion and one other was partly excavated. At the Cortland unit the circular pools were completed and both hatchery buildings were enlarged.

The Lake Mills (Wis.) station established an all-time record in the production of pondfishes; largemouth black bass being the major species handled. The output of trout was normal, approximately 232,000 fingerling brook, brown, and rainbows being distributed for the restocking of waters in that vicinity. During the year, ponds were excavated as follows: 2 ponds 4 acres in area; 1 pond 1 acre in area; and 5 ponds ranging from $\frac{1}{5}$ to $\frac{1}{3}$ of an acre. Outlet kettles and the necessary supply and drainage lines were installed in these ponds. The exteriors of all buildings were given 2 coats of paint and the interior of the hatchery building was painted.

## APPALACHIAN AND BLUE RIDGE TROUT STATIONS

The Smokemont (N. C.) station produced 326,000 rainbow and brook trout, ranging in size from 3 to 7 inches, for the stocking of waters in the Great Smoky Mountain National Park and the Cherokee Indian Reservation. A built-in refrigerator for the storage of fish food was constructed and the necessary refrigerating machinery installed.

The Pisgah Forest (N. C.) unit, which is located on the Davidson River in the Pisgah National Forest, reared its output of approximately 50,000 brook, brown, and rainbow trout to a large size before releasing them. Fishing records maintained for the season would indicate that better catches are now being made from the waters of the Pisgah Forest. This is attributed to the stocking and stream management programs formulated.

The Walhalla (S. C.) station conducted its fish-cultural activities along routine lines and attained normal success in the production and distribution of brook and rainbow trout fingerlings. A hydroelectric unit was installed to provide power and lights for station operations. The trout reared in the ponds at the Franklin (N. C.) and Clayton (Ga.) substations were liberated in the waters of the Nantahala and Chattahoochee Forests, respectively.

## PONDFISH STATIONS

Although records indicate that there has been a larger number of pondfish distributed in previous years, a large percentage of such fish were obtained from rescue operations along the Mississippi River. The actual number of warm-water fish produced at the various hatcheries sets an all-time record. The largest increase was in the production of largemouth black bass. Notwithstanding the fact that weather and other conditions, over which there is no control, influence the production of pondfish, the principal requirement for a large output of bass and other warm-water species is space. Therefore, in an endeavor to properly stock waters which are suitable for such species, the Bureau is constructing new hatcheries, and pond acreage at the old-established units is being enlarged as funds will permit.

The total production of largemouth black bass, sunfish, and crappie at the Harrison Lake hatchery, located at Roxbury, Va., was practically the same as last year. Efforts are being made to increase the natural food by introducing aquatic plants in the ponds. Pond dikes were straightened, raised, and regraded, and grounds were landscaped by enrollees of a nearby C. C. C. camp.

For some unknown reason the production of each species, forage as well as game, handled at the Lake Park (Ga.) station was far below normal. As the vitality of the fish collected was low, there was high mortality in the holding shed and on some of the distribution trips. The Division of Wildlife of the State of Georgia distributed the larger portion of the fish produced at this unit, as well as those produced at the Warm Springs (Ga.) station. During the year the following four new buildings were constructed at Lake Park: Residence, two-car garage, holding shed, and a small office building. Roads were repaired, and two new bridges were constructed.

As the Louisville (Ky.) station was inundated in 1937, and practically all of the brood stock was lost, this hatchery's annual output is not, as yet, on a level with that for the years previous to the flood. The wild-brood stock collected from various sources is becoming acclimated and domesticated to pond conditions, and, with favorable weather conditions during the spawning season, the output of bass fry should have been greater. In addition to the propagation of smallmouth black bass, largemouth black bass, sunfish, crappie, and rock bass, this unit raised golden shiners and blackhead minnows for forage. A three-car garage and carpenter shop was constructed, and all buildings were repaired and painted. Two new ponds are being excavated. At the close of the year one pond was completed, except for the outlet kettle. The construction activities were carried on under the auspices of W. P. A. and P. W. A.

The Tennessee Valley Authority's hatchery at Norris, Tenn., which is operated by the Bureau, liberated its production of bass and bream in Norris Lake. From the 500,000 pike perch eggs furnished this unit from the Put in Bay (Ohio) station, 450,000 fry were hatched and planted in the lake.

From the Palestine (W. Va.) hatchery, which was operated in cooperation with the West Virginia Conservation Commission, 181,510 fingerling bass, bream, and crappie were distributed. This station was successful in securing a brood stock of channel catfish.

At the Orangeburg (S. C.) hatchery, and its nearby auxiliaries, the production of 1,009,185 fingerling pondfish exceeds that of any previous year. This output is a 94-percent increase over that of last season. Largemouth black bass and bluegill sunfish were the major species handled, while a limited production of redbreasted sunfish, red-eared sunfish, warmouth bass, catfish, crappie, and yellow perch was attained. The completion of a 900-foot section of the reinforced-concrete storm channel provides a canal the entire length of the pond system, thus eliminating hazards which greatly endangered the station ponds heretofore. A new one-story residence, consisting of six rooms and bath, was constructed. A storage shed and two garages were also constructed. The painting of all buildings was about 90 percent completed at the close of the year.

From 25 acres of water available for the production of fish at the Hoffman (N. C.) unit, 843,115 fish, of which all except 25,000 were fingerlings, were distributed. This output consisted of largemouth black bass, warmouth bass, sunfish, and crappie. In accordance with an agreement, several thousand of these fish were liberated in the ponds and lakes on the land utilization project in which this station is located. A site was cleared for the construction of 3 additional ponds, each of approximately 1 acre in area. One of the ponds was completed and considerable excavation work was done on the others. A combination holding and shipping shed, housing 4 concrete holding tanks, was constructed.

The output of fish from the Marion (Ala.) hatchery was the largest in the history of the station. The total output of largemouth black bass, bream, crappie, and rock bass was 3,228,390. Although some of the early bass eggs were lost on account of adverse weather conditions, the production of this species was in excess of 1,067,000 for the year. This station was unable to maintain a sufficient stock of crappie and rock bass and, consequently, the output of these species was inadequate to meet the demand. Twelve ponds, covering 16 acres, were added to the pond system. A well was drilled which produced 120 gallons of water per minute to furnish the necessary water for these ponds. A new holding shed is being constructed near this well in order to facilitate the handling of fish produced in the surrounding ponds. The levees on several of the old ponds were reinforced with dirt obtained from shallow areas. In addition to the above construction work, a number of repairs and improvements were made to buildings, roads, fences, drains, pond levees, etc.

Although the Cohutta (Ga.) station was under construction during the entire year, a limited production of smallmouth black bass, largemouth black bass, and Kentucky bass fry and small fingerlings was obtained for distribution during the spring. Six ponds were excavated during the period, which gives this station a total of 12 ponds. The office building, garage and workshop, holding house, residence, and pumphouse were completed. Grounds were cleared of underbrush and dead trees, and the areas around the buildings and pond embankments were sodded.

In spite of the fact that high winds prevailed at the Lyman (Miss.) station during the spring spawning season, this unit produced approximately 684,000 fingerling black bass and bream. The bass at this station grow very rapidly during the early part of the season, some attaining a length of 4 inches in 6 to 8 weeks. Owing to the various sizes of bream taken from the ponds when they were drained, it is believed that this species spawned at least 9 months of the year in this locality. By enlarging the existing ponds, the water acreage was increased approximately 8½ acres. All levees were regraded and seeded with Bermuda grass, and willows were planted to prevent erosion around embankments except where there was danger of the roots clogging drainage lines.

Seventeen ponds covering 11.83 acres at the Marianna, (Fla.) unit were completed during the fall of 1938. On filling these ponds with water it was found that 6, due to seepage through the bottoms, would not hold sufficient water for the production of fish. Therefore, the output of 114,000 fry and 92,650 fingerling bass distributed from this station during the spring represents the production obtained from 5.93 acres of water. Difficulty was also encountered in obtaining sufficient brood stock from local sources for properly stocking the ponds that were utilized. As there was an unusually heavy culture of daphnia in the ponds used, the fish showed a remarkable growth. At the close of the year preparations were being made to apply a waterproofing treatment to the bottoms of all ponds. All buildings were completed and the surrounding grounds landscaped.

The Tupelo (Miss.) station, which has a pond area of only 16½ acres, produced more than 850,000 bass and bream, of which all except 198,000 were fingerlings. While the output of fingerling bass per acre was 42,500, the bream production was below 17,000. A six-room cottage was constructed. Approximately 8 inches of dirt was removed from four of the pond bottoms to eliminate the growth of water lilies, which have hindered the production and collection of young fish.

Inasmuch as several of the ponds at the Warm Springs (Ga.) station were not in operation, because of the fact that new supply and drainage lines were being laid and pond banks were being repaired and widened, the output of fish was slightly less than that of last year Nevertheless, this unit produced approximately one-half million bass and bream for distribution. Catfish were received from the Lake Park unit and redistributed to applicants. In addition to the above construction activities, all buildings were repaired and painted.

Although unfavorable weather conditions prevailed and the water in the ponds was turbid during the spawning season, the Mammoth Spring (Ark.) unit attained a new record in the production of smallmouth black bass, with an output of 237,000 fry and 150,000 fingerlings. In addition to this species, largemouth black bass, rock bass, and bluegill sunfish were handled. A five-room cottage was constructed and repairs were made to all buildings, the barn being converted into a two-car garage. New concrete kettles were poured in three ponds and the levees and bottoms to all ponds were repaired and graded.

The city of St. Louis, Mo., with the assistance of the W. P. A. and P. W. A., built at the Forest Park station a new stone structure consisting of living quarters, office, garage, workshop, and holding shed. Ten new lakes were built and several of the old lakes and lagoons were deepened, cleaned, and reconditioned. New outlets were constructed and a better water supply system arranged to each lake and lagoon section. Due to these activities some of the lakes were not on a productive basis. Nevertheless, this unit produced approximately

400,000 fingerling fish for distribution. This station has proved a very valuable addition to the Bureau, inasmuch as it furnishes fish for the stocking of waters which heretofore had to be supplied from some remote point.

At the Tishomingo (Okla.) station approximately 14 acres of additional ponds were constructed. The following stone structures were built at this point: Four-room residence, three-stall garage, tool shed, and oil house. A holding shed is also under construction. Shortage of rainfall lowered Pennington Creek, the source of water supply, to where it was not flowing enough to maintain the proper level in the ponds. However, the 1939 output of fish was 716,980 fingerlings. Efforts to propagate channel catfish were a failure.

At the Natchitoches (La.) station W. P. A. and P. W. A. workers were engaged throughout the greater part of the year in the excavating of new ponds, laying of drainage and supply lines, building of a fence, gravelling of roads, repairing old pond bottoms and embankments, and constructing outlet kettles. Nevertheless, the output of fingerling largemouth black bass, warmouth bass, and sunfish was in excess of the previous year's record.

In addition to distributing more than 1 million fingerling largemouth black bass, bluegill sunfish, Rio Grande perch, and channel catfish, the Uvalde (Tex.) station liberated approximately 400,000 bass fry in local waters. The 39 ponds, totalling 44 acres in area, were devoted to the propagation of game species of fish, and 12 ponds, about 1/6 acre each in area, for the handling of forage minnows. As the water at this hatchery contains certain chemicals, the steel water-supply lines were corroded to the point where it was necessary to replace them. At the end of the year approximately 85 percent of the lines had been replaced with composition pipe. An addition to the implement building was constructed and the exteriors of all station buildings were painted.

The output of fry and fingerlings from the San Marcos (Tex.) unit approximated normal figures. Several old buildings were razed and a new combination garage, shop, and storage structure was built. A small building was also constructed for the purpose of storing paint, oil and grease, and other highly inflammable supplies. All old station buildings were repaired and painted. Considerable work was done on ponds, grounds, levees, and roads.

From the brood stock of 4 species of fish handled at the San Angelo (Tex.) Station, more than 1/4 million fingerling fish were distributed. Extensive daphnia culture was carried on during the spring months to produce food for the fry, and golden shiners were introduced in the rearing ponds when the bass were about 1 1/2 inches long. A residence and double garage were constructed during the year. The pond system drainage line was completed. The exteriors of all buildings were painted, the grounds around the new buildings landscaped, and the station driveways were regraded.

At the Fort Worth (Tex.) station the output of sunfish and warmouth bass was in excess of that of last year, while there was a slight recession in the number of largemouth black bass, crappie, and catfish distributed. This station was enlarged by the acquisition of a site containing 31 acres, on which 10 ponds, covering approximately 14 acres, were excavated. All old pond embankments were repaired and the bottoms of 2 were regraded. New concrete outlet kettles were built in all ponds. The following buildings were constructed: Four-room cottage, garage and store building, oil and paint house, blacksmith shop, and holding shed. In addition to these activities the station property was fenced in, all buildings were painted, the drainage system was enlarged, roads were graded, and grounds were landscaped.

The Welaka (Fla.) station, which was received by transfer from the Farm Security Administration the latter part of last year, was favored with W. P. A. and P. W. A. projects for prosecuting extensive construction work. Complete individual supply and drainage systems were installed in eight ponds at the Beecher unit. New kettles were constructed in eight new 2-acre ponds, and pond bottoms were graded to allow sufficient drainage for collection of fish. There was installed a new supply and drainage system for the series of 24 one-acre ponds. Repairs were made to old residences. A four-car garage was constructed, a laboratory building was erected, and two 6-room stucco cottages were partially finished. Nevertheless, this unit distributed approximately 100,000 fry and 300,000 fingerling black bass as well as a limited number of sunfish.

At the Fairport (Iowa) station considerable repair work to pond bottoms, embankments, kettles, and supply and drainage lines was accomplished. For reasons previously mentioned, salvage work in this field was not necessary this year. As this unit is fully equipped to handle rescue work, it cooperated with the State Conservation Department and sportsmen's organizations in eastern Iowa in the collecting of fish from stagnant inland waters and liberated them in suitable waters. Gratifying success was attained in the culture of yellow and channel catfish.

In the Indiana field, the Rochester station established an all-time record in the production of pondfishes. The total output of all species handled at Rochester and the Argos auxiliary was in excess of 2 million—an increase of more than 1 million over last year. Further experiments in the culture of spoonbill catfish in ponds were undertaken at this hatchery, but the results were nil. The dam at Lake Manitou, the station's water supply, was torn out and rebuilt. Sheet steel piling was driven along the toe of the dam to a depth of 18 feet to prevent seepage, and the floor, wing walls, and apron were reconstructed of reinforced concrete. A six-room residence and garage, both of brick, were constructed. A new bridge was built across the creek that traverses the station grounds.

## UPPER MISSISSIPPI WILDLIFE AND FISH REFUGE

Up to this year the principal activities within the Upper Mississippi Wild Life and Fish Refuge have been the salvage of stranded fish in overflow areas. However, the virtual completion of the 9-foot channel has nullified this activity, as is shown by the fact that only 1,864,820 fish were rescued in comparison with the annual turnover of 40 or 50 million fish in previous years.

A new phase of activity has, therefore, been undertaken by the construction of an extensive series of propagating ponds, many entirely artificial while others are seminatural. Several of these have been in use for the past few seasons and have yielded excellent results. During the year additional pond acreage was under development at Genoa, Wis., and Guttenberg, Iowa. The former, which produced approximately two million bass fingerlings, now constitutes an extensive fish-cultural unit, while the latter, when completed, will be one of the largest hatchery developments in the country. A number of years will be required for full realization of this program, but the projects are being placed in productive operation as fast as individual ponds can be completed. The La Crosse (Wis.) Station, headquarters for these activities, has hatched and distributed 1,082,600 trout for direct planting in suitable waters and for transfer to Forest Service rearing ponds and cooperative nurseries maintained by sportsmen's clubs.

The Homer (Minn.) substation was largely engaged in the overhauling and repairing of equipment, boats, trucks, etc., utilized in that territory. The personnel also constructed seines, dip nets, egg cases, boats, outlet kettle forms, and other apparatus for use at the various hatcheries.

*Fish rescued and restored to original waters, fiscal year 1939*

| *Species* | *Number* |
|---|---|
| Black bass | 9, 700 |
| Crappie | 121, 300 |
| Sunfish | 210, 400 |
| Catfish | 1, 379, 000 |
| Yellow perch | 93, 600 |
| Pike pickerel | 2, 620 |
| Buffalofish | 31, 700 |
| White bass | 7, 500 |
| Miscellaneous | 9, 000 |
| Total | 1, 864, 820 |

NOTE.—The station at Guttenberg, Iowa, handled 1,352,020 of the above-enumerated fish and the station at Marquette, Iowa, handled 512,800.

## AQUARIUM

The Bureau of Fisheries' aquarium, which is located in the basement under the main lobby in the Department of Commerce Building, has constantly increased in popularity among all classes of visitors. The fact that it is open to the public on Saturday afternoons and Sundays until 4 p. m. has enabled many who would not otherwise find it possible to view the displays during the weekends.

The number of specimens and species on display has varied somewhat during the year, but, as a general rule, approximately 1,500 individual specimens, representing about 50 varieties, are shown in the 47 tanks and 3 floor pools.

A consignment of spoonbill catfish (*Polyodon spathula*) collected from the Ohio River was received. However, the shipment arrived during the rainy season and the fish were unable to endure the chlorine in the water. Small activated carbon filters have been installed for the purpose of removing as much of the chlorine as possible in order to maintain the species that are susceptible to this chemical.

Further experiments were made with potassium permanganate in the treatment of fish affected by external parasites, expecially with regard to the application of such remedial measures to specimens held in outdoor pools.

The seasonal miniature hatchery, which is a special attraction to biology classes, was on display for the purpose of illustrating the methods utilized to incubate non-buoyant and semi-buoyant eggs.

In addition to holding fish in the reserve tanks for distribution to applicants in this locality, the aquarium was used in preparing and forwarding shipments of live fish and eggs to Puerto Rico and Colombia.

## DISTRIBUTION OPERATIONS

As the majority of distribution-car trips are made from stations in the Mississippi River territory, this service was partly decentralized during the year by the assignment of an Assistant Superintendent of Distribution to the La Crosse (Wis.) station. This procedure will expedite distribution, inasmuch as it is often necessary to move fish in that area without delay. This condition was brought about by the fact that the ponds constructed in the Mississippi River refuge have been very productive, and proper holding facilities for large numbers of fish are not available.

The same number of fish can be carried by truck as by distribution car, to destinations within a radius of approximately 300 miles, at about one-fourth the cost. For this reason the Bureau is purchasing additional automotive equipment, as funds permit, and car No. 7, the oldest distribution car in Bureau service, was decommissioned and recommended for condemnation.

Many types of aerating equipment are in use at present by various Government and private agencies engaged in the distribution of fish by truck. The purpose of this equipment is the maintenance of the oxygen content and temperature of the water in the truck tanks at a level best suited to the fish during transportation. The Bureau's distribution trucks have been equipped with several different types of aerating apparatus in an effort to determine, from experience in actual use, which is best suited to this service. Upon conclusion of these trials the type of apparatus which has rendered the most satisfactory service will be adopted as standard.

Truck deliveries during the year aggregated 333,950 miles, exclusive of the distance traveled by National Park, National Forest, and State conservation department trucks engaged in the distribution of fish produced at Federal hatcheries. Neither does the above figure include travel by individuals and sportsmen's organizations who called at the hatcheries to receive their allotments of fish. The distribution cars engaged in the delivery of fish to applicants, and transfers of fish between hatcheries, made 77 trips during the year and carried an average of 260 pails per trip. The cars traveled 52,899 paid miles and 11,789 free miles. Detached messengers traveled 45,152 paid miles and 1,639 free miles in delivering fish to applicants. The Bureau was again favored with free transportation and reduced rates by a number of the railroads.

*Summary, by States, of the distribution of fish, fiscal year 1939*

| State and species | Number |
|---|---|
| Alabama: | |
| Black bass, largemouth | 871,280 |
| Black bass, smallmouth | 27,600 |
| Catfish | 20 |
| Crappie | 150 |
| Rainbow trout | 20,100 |
| Rock bass | 1,770 |
| Sunfish | 1,836,320 |
| Arizona: Black bass, largemouth | 40,000 |
| Arkansas: | |
| Black bass, largemouth | 138,075 |
| Black bass, smallmouth | 110.000 |
| Crappie | 6,125 |
| Rainbow trout | 1.100 |
| Rock bass | 8,000 |
| Sunfish | 55,250 |
| Warmouth bass | 1,500 |
| California: Chinook salmon | 18,088,500 |
| Colorado: | |
| Black bass, largemouth | 29,900 |
| Blackspotted trout | 1,094,780 |
| Brook trout | 2,053,995 |
| Catfish | 4,600 |
| Crappie | 3.000 |
| Lake trout | 21,700 |
| Loch Leven trout | 102.800 |
| Rainbow trout | 1,151.850 |
| Rock bass | 615 |
| Sunfish | 16,300 |
| Connecticut: | |
| Black bass, smallmouth | 398,000 |
| Brook trout | 19,500 |
| Rainbow trout | 3,250 |
| Florida: | |
| Black bass, largemouth | 547,195 |
| Catfish | 300 |
| Sunfish | 19,960 |
| Georgia: | |
| Black bass, largemouth | 337,185 |
| Black bass, smallmouth | 3,640 |
| Brook trout | 185,260 |
| Catfish | 8,950 |
| Crappie | 1,010 |
| Kentucky bass | 7,250 |
| Rainbow trout | 84,945 |
| Sunfish | 519,530 |
| Idaho: | |
| Blackspotted trout | 669,050 |
| Brook trout | 167,045 |
| Landlocked sockeye salmon | 318,200 |
| Rainbow trout | 1,698,410 |
| Sockeye salmon | 159,870 |
| Steelhead trout | 17,360 |
| Illinois: | |
| Black bass, largemouth | 18,840 |
| Black bass, smallmouth | 52.000 |
| Brook trout | 5,500 |
| Catfish | 7,350 |
| Crappie | 2,910 |
| Pike perch | 1,500,000 |
| Sunfish | 29,505 |
| Indiana: | |
| Black bass, largemouth | 1,133,850 |
| Black bass, smallmouth | 38,070 |
| Brook trout | 105,200 |
| Catfish | 4,340 |
| Crappie | 6,750 |
| Loch Leven trout | 163,840 |
| Rainbow trout | 99,415 |
| Rock bass | 34,725 |
| Sunfish | 657,400 |
| Yellow perch | 2,590 |
| Iowa: | |
| Black bass, largemouth | 53,905 |
| Black bass, smallmouth | 3,600 |
| Buffalofish | 800 |
| Catfish | 220,385 |
| Crappie | 26,630 |
| Loch Leven trout | 10,100 |
| Rainbow trout | 23,675 |
| Iowa—Continued. | |
| Rock bass | 9,220 |
| Sunfish | 184,840 |
| Kansas: | |
| Black bass, largemouth | 8,560 |
| Crappie | 850 |
| Rainbow trout | 5,000 |
| Sunfish | 14,700 |
| Kentucky: | |
| Black bass, largemouth | 63,330 |
| Black bass, smallmouth | 305,140 |
| Crappie | 300 |
| Rock bass | 12,100 |
| Sunfish | 8,445 |
| Louisiana: | |
| Black bass, largemouth | 273,840 |
| Sunfish | 415,850 |
| Warmouth bass | 33,615 |
| Maine: | |
| Black bass, smallmouth | 84.000 |
| Brook trout | 558,585 |
| Flounder | 603,000,000 |
| Lake trout | 67,800 |
| Lobster | 2,900,450 |
| Rainbow trout | 4,800 |
| Maryland: | |
| Black bass, largemouth | 43.750 |
| Black bass, smallmouth | 800 |
| Brook trout | 100 |
| Catfish | 150 |
| Loch Leven trout | 2,995 |
| Rainbow trout | 81,560 |
| Sunfish | 20,965 |
| Yellow perch | 6,701,850 |
| Massachusetts: | |
| Black bass, smallmouth | 147,000 |
| Brook trout | 336,090 |
| Cod | 132,605,190 |
| Flounder | 277,133,170 |
| Haddock | 5,768,340 |
| Lobster | 1,148,500 |
| Mackerel | 11,060,000 |
| Pollock | 50,762,700 |
| Rainbow trout | 20,720 |
| Michigan: | |
| Black bass, largemouth | 271,670 |
| Black bass, smallmouth | 9,675 |
| Brook trout | 827,720 |
| Lake trout | 692,250 |
| Loch Leven trout | 1,200 |
| Rainbow trout | 115,770 |
| Sunfish | 120,350 |
| Whitefish | 900,000 |
| Minnesota: | |
| Black bass, largemouth | 525,735 |
| Black bass, smallmouth | 4,520 |
| Brook trout | 372,400 |
| Crappie | 11,575 |
| Lake herring | 3,000,000 |
| Lake trout | 185,500 |
| Loch Leven trout | 96,400 |
| Pike perch | 13,640,000 |
| Rainbow trout | 94,900 |
| Sunfish | 24,050 |
| Mississippi: | |
| Black bass, largemouth | 968,000 |
| Sunfish | 860,925 |
| Missouri: | |
| Black bass, largemouth | 771,940 |
| Black bass, smallmouth | 200,000 |
| Catfish | 10.450 |
| Crappie | 47,100 |
| Rainbow trout | 50,000 |
| Rock bass | 7,500 |
| Sunfish | 153,240 |
| Montana: | |
| Black bass, largemouth | 7,670 |
| Blackspotted trout | 3,171,655 |
| Brook trout | 248,010 |
| Catfish | 43,715 |

*Summary, by States, of the distribution of fish, fiscal year 1939*—Continued

| State and species | Number |
|---|---|
| Montana—Continued. | |
| Crappie | 28,500 |
| Golden trout | 71,040 |
| Grayling | 445,280 |
| Loch Leven trout | 268,400 |
| Rainbow trout | 1,142,170 |
| Sunfish | 46,960 |
| Nebraska: | |
| Black bass, largemouth | 10,600 |
| Brook trout | 146,150 |
| Catfish | 11,300 |
| Crappie | 25,775 |
| Grayling | 2,770 |
| Rainbow trout | 398,200 |
| Rock bass | 4,500 |
| Sunfish | 6,000 |
| Nevada: | |
| Black bass, largemouth | 86,000 |
| Brook trout | 52,000 |
| Rainbow trout | 79,480 |
| New Hampshire: | |
| Black bass, smallmouth | 147,000 |
| Brook trout | 470,870 |
| Catfish | 200 |
| Lake trout | 3,500 |
| Loch Leven trout | 2,500 |
| Rainbow trout | 3,340 |
| New Jersey: | |
| Black bass, largemouth | 10,280 |
| Brook trout | 10,000 |
| Catfish | 100 |
| Flounder | 11,774,000 |
| Rainbow trout | 27,400 |
| Sunfish | 13,850 |
| New Mexico: | |
| Black bass, largemouth | 883,010 |
| Black bass, smallmouth | 12,000 |
| Blackspotted trout | 93,000 |
| Brook trout | 37,900 |
| Catfish | 17,420 |
| Crappie | 33,630 |
| Rainbow trout | 480,000 |
| Sunfish | 568,800 |
| New York: | |
| Black bass, largemouth | 10,500 |
| Black bass, smallmouth | 243,685 |
| Brook trout | 735,125 |
| Flounder | 172,578,000 |
| Lake trout | 756,970 |
| Loch Leven trout | 118,915 |
| Rainbow trout | 127,000 |
| Whitefish | 20,000 |
| North Carolina: | |
| Black bass, largemouth | 713,060 |
| Brook trout | 223,325 |
| Crappie | 37,670 |
| Loch Leven trout | 40,145 |
| Rainbow trout | 317,175 |
| Rock bass | 500 |
| Shad | 6,615,000 |
| Striped bass | 1,797,950 |
| Sunfish | 251,890 |
| Warmouth bass | 16,000 |
| White perch | 4,300,000 |
| Yellow perch | 998,140 |
| North Dakota: | |
| Black bass, largemouth | 51,300 |
| Brook trout | 750 |
| Catfish | 2,750 |
| Crappie | 23,820 |
| Sunfish | 20,520 |
| Ohio: | |
| Black bass, largemouth | 135,740 |
| Brook trout | 5,200 |
| Catfish | 9,200 |
| Crappie | 2,025 |
| Loch Leven trout | 35,000 |
| Pike perch | 314,500,000 |
| Rainbow trout | 38,850 |
| Rock bass | 20,950 |
| Sunfish | 88,100 |
| Oklahoma: | |
| Black bass, largemouth | 199,340 |
| Crappie | 25,930 |
| Rainbow trout | 4,540 |
| Sunfish | 567,950 |
| Oregon: | |
| Brook trout | 508,145 |
| Chinook salmon | 1,946,280 |
| Rainbow trout | 215,000 |
| Steelhead trout | 63,000 |
| Pennsylvania: | |
| Black bass, largemouth | 50,415 |
| Brook trout | 194,940 |
| Catfish | 7,750 |
| Loch Leven trout | 135,665 |
| Rainbow trout | 240,815 |
| Sunfish | 81,950 |
| Rhode Island: | |
| Black bass, smallmouth | 4,000 |
| Brook trout | 750 |
| Flounder | 121,455,000 |
| South Carolina: | |
| Black bass, largemouth | 459,935 |
| Black bass, smallmouth | 50 |
| Brook trout | 135,405 |
| Catfish | 500 |
| Crappie | 20,975 |
| Loch Leven trout | 2,000 |
| Rainbow trout | 144,125 |
| Shad | 1,534,000 |
| Sunfish | 822,975 |
| Warmouth bass | 32,800 |
| Yellow perch | 1,800 |
| South Dakota: | |
| Black bass, largemouth | 25,610 |
| Blackspotted trout | 22,000 |
| Brook trout | 102,185 |
| Catfish | 43,750 |
| Crappie | 8,500 |
| Loch Leven trout | 52,500 |
| Rainbow trout | 600,655 |
| Sunfish | 24,000 |
| Tennessee: | |
| Black bass, largemouth | 837,750 |
| Black bass, smallmouth | 28,750 |
| Brook trout | 190,630 |
| Crappie | 550 |
| Kentucky bass | 3,100 |
| Loch Leven trout | 2,350 |
| Pike perch | 450,000 |
| Rainbow trout | 536,380 |
| Rock bass | 8,975 |
| Sunfish | 101,290 |
| Texas: | |
| Black bass, largemouth | 1,441,270 |
| Catfish | 8,600 |
| Crappie | 30,790 |
| Rainbow trout | 7,500 |
| Rio Grande perch | 175,760 |
| Rock bass | 5,100 |
| Sunfish | 897,515 |
| Warmouth bass | 8,100 |
| Utah: | |
| Black bass, largemouth | 4,295 |
| Blackspotted trout | 657,160 |
| Brook trout | 565,410 |
| Chum salmon | 94,080 |
| Landlocked sockeye salmon | 47,000 |
| Rainbow trout | 573,665 |
| Silver salmon | 78,955 |
| Sockeye salmon | 188,080 |
| Sunfish | 800 |
| Vermont: | |
| Black bass, largemouth | 1,275 |
| Brook trout | 1,330,365 |
| Lake trout | 12,000 |
| Landlocked salmon | 5,990 |
| Rainbow trout | 2,500 |
| Virginia: | |
| Black bass, largemouth | 91,380 |
| Black bass, smallmouth | 6,485 |

*Summary, by States, of the distribution of fish, fiscal year 1939*—Continued

| State and species | Number |
|---|---|
| Virginia—Continued. | |
| Brook trout | 134, 395 |
| Catfish | 275 |
| Crappie | 7, 285 |
| Pike Perch | 400, 000 |
| Rainbow trout | 475, 915 |
| Rock bass | 12, 500 |
| Shad | 31, 174, 225 |
| Sunfish | 112, 640 |
| Yellow perch | 292, 968, 000 |
| Washington: | |
| Black bass, largemouth | 3, 125 |
| Blackspotted trout | 664, 765 |
| Brook trout | 661, 250 |
| Chinook salmon | 28, 247, 230 |
| Chum salmon | 7, 876, 275 |
| Crappie | 6, 000 |
| Rainbow trout | 539, 210 |
| Silver salmon | 716, 675 |
| Sockeye salmon | 1, 557, 555 |
| Steelhead trout | 864, 900 |
| Sunfish | 13, 000 |
| West Virginia: | |
| Black bass, largemouth | 39, 105 |
| Black bass, smallmouth | 10, 380 |
| Brook trout | 28, 480 |
| West Virginia—Continued. | |
| Crappie | 17, 600 |
| Lock Leven trout | 23, 760 |
| Rainbow trout | 109, 825 |
| Sunfish | 151, 860 |
| Wisconsin: | |
| Black bass, largemouth | 1, 395, 545 |
| Black bass, smallmouth | 16, 000 |
| Brook trout | 460, 100 |
| Catfish | 3, 700 |
| Crappie | 47, 250 |
| Lock Leven trout | 257, 420 |
| Rainbow trout | 280, 800 |
| Sunfish | 38, 350 |
| Yellow perch | 600 |
| Wyoming: | |
| Black bass, largemouth | 10, 050 |
| Blackspotted trout | 7, 151, 600 |
| Brook trout | 742, 745 |
| Catfish | 16, 325 |
| Grayling | 4, 306, 755 |
| Lake trout | 7, 500 |
| Rainbow trout | 577, 050 |
| Sunfish | 4, 150 |
| Yellow perch | 10, 000 |

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF FISHERIES

# REPORT

OF THE

# UNITED STATES COMMISSIONER OF FISHERIES

FOR THE FISCAL YEAR 1940

WITH

## APPENDIXES

CHARLES E. JACKSON
Acting Commissioner

March 3, 1849

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1950

## NOTE

The first section of this volume, entitled "Bureau of Fisheries," constitutes what was known in years prior to 1933 as "Report of the Commissioner of Fisheries." Since then, in the interests of economy, it is a reprint from the "Annual Report of the Secretary of Commerce." The pagination, therefore, is the same as that of the Secretary's Report, rather than beginning with page I.

The Bureau of Fisheries was transferred on July 1, 1939, from the Department of Commerce to the Department of the Interior; on June 30 1940, it was consolidated with the Bureau of Biological Survey to form the Fish and Wildlife Service.

## CONTENTS

Page

Bureau of Fisheries. By Charles E. Jackson ---- 291–329

Progress in Biological Inquiries, 1938. By Elmer Higgins, Appendix 1. Administrative Report 39 ---- 1–96

Alaska Fishery and Fur-seal Industries in 1939. By Ward T. Bower. Appendix II. Administrative Report 40 ---- 97–184

Fishery Industries of the United States, 1939. By R. H. Fiedler. Appendix III. Administrative Report 41 ---- 185–554

Propagation and Distribution of Food Fishes, 1940. By Glen C. Leach, M. C. James, and E. J. Douglass. Appendix IV. Administrative Report 38 ---- 555–603

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# U. S. DEPARTMENT OF THE INTERIOR

## BUREAU OF FISHERIES

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HEADQUARTERS STAFF, 1939–40

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*Acting Commissioner*

CHARLES E. JACKSON

*Administrative Assistant.*—JOHN R. GARDNER.
*Chiefs of Divisions:*
  *Fish Culture.*—GLEN C. LEACH.
  *Inquiry Respecting Food Fishes.*—ELMER HIGGINS.
  *Fishery Industries.*—R. H. FIEDLER.
  *Alaska Service.*—WARD T. BOWER.
  *Black Bass and Anglers.*—TALBOTT DENMEAD.
*Director of Aquarium.*—FRED G. ORSINGER.
*Editor.*—HAROLD B. CARR.
*Librarian.*—GLADYS JOHNSON.
*Publications.*—BARBARA ALLER.

# Report of the Acting Commissioner of Fisheries

1940

DEPARTMENT OF THE INTERIOR

# UNITED STATES DEPARTMENT OF THE INTERIOR

Harold L. Ickes, Secretary

## BUREAU OF FISHERIES

Charles E. Jackson, Acting Commissioner

Report of the Acting Commissioner of the Bureau of Fisheries, 1940, reprinted from the Annual Report of the Secretary of the Interior, 1940, pp. 291-329]

## CONTENTS

| | Page |
|---|---|
| Summary | 292 |
| International relations | 293 |
| Halibut investigations | 293 |
| The International Pacific Salmon Fisheries Commission | 295 |
| Cooperation with Federal, State, and other agencies | 298 |
| Construction activities | 299 |
| Japanese activities in Bering Sea | 300 |
| Alaska Fisheries Service | 301 |
| Administration of fishery laws and regulations | 301 |
| Products of the fisheries | 303 |
| Alaska Fur-Seal Service | 303 |
| General activities | 303 |
| Seal herd | 304 |
| Take of sealskins | 304 |
| Sale of sealskins | 305 |
| Foxes | 305 |
| Fur-seal skins taken by natives | 305 |
| Fur-seal patrol | 306 |
| Protection of sea otters, walruses, and sea lions | 306 |
| Propagation and distribution of food and game fishes | 306 |
| Propagation of commercial species | 307 |
| Pacific salmon | 307 |
| Anadromous species, Atlantic coast | 308 |
| Commercial species, interior waters | 309 |
| Game species | 309 |
| Upper Mississippi Wildlife and Fish Refuge | 310 |
| Division of Fishery Industries | 311 |
| Fishery Market News Service | 311 |
| Statistical investigations | 312 |
| Sectional surveys | 313 |
| Landings at certain important United States ports | 313 |
| Shad and alewife fisheries | 313 |
| Canned fishery products and byproducts | 314 |
| Cold-storage holdings of fish | 314 |
| Sponge market, Tarpon Springs, Fla | 314 |
| Technological investigations | 314 |
| Preservation of fishery products for food | 315 |
| Manufacture of fishery byproducts | 315 |
| Nutritive value of aquatic products | 315 |
| Economic and marketing investigations | 316 |
| Biological fishery investigations | 317 |
| North Atlantic fishery investigations | 317 |
| Middle and South Atlantic fishery investigations | 319 |
| Long Island cooperative investigation | 320 |
| Shrimp investigations | 320 |
| North Pacific and Alaska fishery investigations | 321 |
| Pacific pilchard investigations | 323 |
| Great Lakes fishery investigations | 324 |
| Shellfish investigations | 325 |
| Sponge investigations | 326 |
| Aquicultural investigations | 326 |
| Water quality investigations | 328 |
| Protection of fish runs from engineering developments | 329 |
| Appropriations | 329 |

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For sale by the Superintendent of Documents, Washington, D. C. Price 10 cents.

Note.—The complete report of the Secretary of the Interior, 1940, also may be obtained from the Superintendent of Documents, Washington, D. C., price 75 cents.

# BUREAU OF FISHERIES

Charles E. Jackson, *Acting Commissioner*

ORIGINALLY established on Feb. 9, 1871, as the United States Commission of Fish and Fisheries, an independent agency, and redesignated the Bureau of Fisheries on July 1, 1903, when it was by law included in the newly created Department of Commerce and Labor, this Bureau has completed 69 years of active service in the field of fishery conservation.[1]

During the past year encouraging progress was made in the development of practical programs of fishery management and in securing State and private cooperation in support of these programs. Biological investigations contributed much fundamental information that will assist in maintaining the productivity of the fisheries. Technological investigations contributed substantially to the development of better methods for the preservation of fishery products and to the more complete utilization of byproducts. Statistical studies provided a measure of abundance for most of the commercial and game species, thus furnishing a basis for regulation and assisting in the orderly production and distribution of fisheries commodities.

During periods of world disaster, such as wars and famines, the problem of supplying wholesome and nutritious foods in sufficient quantities is of paramount importance to the Nation—not only as it affects the armed forces, but the country as a whole. Such a condition prevailed during the last World War and is likely to again occur should similar conditions arise.

Under authority of the Secretary and the absolute control of the Bureau of Fisheries, the Alaska salmon in 1917 provided the fisheries resource from which the pack was increased over that of of 1916 by about 25 percent, or 2,520,128 cases. This increased production on short notice is indicative of the ability of the Bureau to so regulate these fisheries as to constantly maintain a reserve upon which to draw.

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[1] This, the Sixty-ninth Annual Report of the Bureau of Fisheries, is the first submitted to the Secretary of the Interior and the last to be made as the Bureau of Fisheries. In accordance with the President's Reorganization Plan No. II, this Bureau was transferred from the Department of Commerce to the Department of the Interior on July 1, 1939; and by Reorganization Plan No. III it was merged with the Bureau of Biological Survey on June 30, 1940, to form the Fish and Wildlife Service.

The Bureau has remained cognizant of the real and potential value of this vast food resource which has been intrusted to its keeping and, although continually providing the markets of the world with a canned fishery product of unquestioned excellence, it has constantly maintained a balance sufficient that should the need arise, production can again be stepped up to the required level.

In carrying on the work of the Bureau it has been necessary to maintain a number of vessels which, although designed primarily for specialized fishery activities, could readily be converted for use by the Navy in times of national emergency. The Bureau fleet could be augmented by hundreds of fishing craft and thus form a defense unit that would contribute materially to the conduct of naval operations.

## SUMMARY

Data on the 1938 catch of fishery products were collected in all sections of the United States and Alaska except the Mississippi River area. The combined catch in the areas surveyed shows a decline of 2 percent in volume and 7 percent in value as compared with the catch in the same sections during the preceding year. Decreased catches were made in each of the geographical sections except the Chesapeake Bay and South Atlantic and Gulf States. Marked declines in the value of the catch occurred in the New England, South Atlantic and Gulf, and Pacific Coast States, and in Alaska. The value of the pack of canned fishery products in all sections declined 21 percent as compared with 1937; byproducts decreased 17 percent; cured fish about 5 percent; and packaged fish, 2 percent.

The total catch of fishery products in the United States and Alaska, as based on the most recent surveys, amounted to 4,253,445,000 pounds, valued at $93,547,000. Slightly more than 130,000 fishermen were employed in making this catch.

The production of canned fishery products in the United States and Alaska during 1938 amounted to 667,527,840 pounds, valued at $83,445,889; the output of byproducts was valued at $30,576,367; the production of frozen fishery products, excluding packaged products, amounted to 117,125,519 pounds, valued at $7,800,000; and fresh and frozen packaged fish and shellfish, 216,661,255 pounds, valued at $27,243,645. Based on surveys for 1938 in all sections except the Mississippi River area, and for 1931 in that area, the production of cured fishery products amounted to 102,617,256 pounds, valued at $14,865,530. It is estimated that about 680,000,000 pounds of fresh fishery products (excluding packaged fish and shellfish) valued at about $50,000,000 were marketed during 1938. The total marketed value to domestic primary handlers of all fishery products in 1938 is estimated at $214,000,000.

## INTERNATIONAL RELATIONS

### HALIBUT INVESTIGATIONS

Under authority of the treaty of January 29, 1937, the International Fisheries Commission continued the regulation of the Pacific halibut fishery and carried on the scientific investigations of the halibut and its fishery, which form the basis for regulation.

The representation of the United States on the Commission was changed during the year. Mr. Frank T. Bell, who had been a member of the Commission since July 31, 1933, resigned effective January 31, 1940. Mr. Charles E. Jackson, Acting Commissioner of the United States Bureau of Fisheries, was appointed to succeed him. The membership of the Commission at the end of the year was: Mr. L. W. Patmore and Mr. A. J. Whitmore, for Canada; Mr. Charles E. Jackson and Mr. Edward W. Allen, for the United States.

Meetings of the Commission were held at Seattle on July 7 and December 12, 13 and 14. At the latter meetings, Mr. L. W. Patmore was elected Chairman and Mr. Edward W. Allen was elected Secretary for the ensuing biennium.

In fulfillment of its regulatory duties, the Commission determined the catch limits necessary for each regulatory area, recorded the catch from each area, forecast and announced the date of attainment of each area limit and closed the areas accordingly. In 1939, areas 1 and 2, which include all halibut-fishing grounds south of Cape Spencer, Alaska, were closed to halibut fishing at midnight July 29. The total catches were 1,068,000 and 24,309,000 pounds, respectively, for the two areas. Of the area 2 catch, 373,000 pounds were taken under permits while fishing for other species after the closure of that area. Areas 3 and 4, which include all the halibut-fishing grounds north and west of Cape Spencer, were closed at midnight October 28 with catches of 25,360,000 pounds and zero pounds respectively.

The 1940 fishing season was opened on April 1 under regulations issued on March 25, 1940. Several changes were made in these regulations to facilitate enforcement and to assure limitation of the catch to the prescribed poundage which is as much as is justified by the present condition of the stock. Possession of undersized halibut was prohibited, fishing was restricted to one area on any one trip, and provision was made for the examination of all records dealing with the landing, purchase, and sale of halibut. At the request of the fleet, the method of closure of area 3 was changed to conform to that of area 2.

Investigations necessary for the fulfillment of the purposes of the treaty were continued by the scientific staff of the Commission. These included the collection and analysis of current statistical and biological data which serve as a measure of the changes occurring in the stocks of halibut as a result of regulation and which are a necessary basis for the continued rational control of the fishery. The biological investigations made necessary the operation of two vessels.

Tagging operations were carried on from a chartered halibut vessel during the winter spawning season in area 2. A total of 1,303 halibut were marked in northern British Columbia and southeastern Alaska. From the recovery of these marked fish it is anticipated that valuable information will be obtained concerning the relationship of the spawning populations to the other stocks within area 2 and regarding the rate at which these spawning populations are being removed by the fishery. Materials for the study of age, growth, sex, and state of maturity were also collected during the operations.

Measurements of halibut landed by the fleet were continued to determine the changes occurring in the size composition of the marketable fish as a result of regulation. Material for the age studies was collected at the same time. Preliminary analysis of the measurements of area 2 fish has failed for the second successive year to show any increase in the average size or in the proportion of larger, and therefore mature fish.

The abundance of halibut as shown by the catch per unit of gear fished did not show the improvement that has characterized the catch of the previous eight years. The abundance in area 2, between Cape Spencer in Alaska and Willapa Bay in Washington, was 12 percent lower in 1939 than in 1938, which brought it back to the 1937 level. No change in abundance from that of the previous year was indicated in area 3, where the stocks are in good condition. Although the abundance in area 2 is still 71 percent greater than in 1930, the last year of unrestricted fishing, the marked decrease in abundance in that area must be regarded with concern in view of the unsatisfactory condition of the spawning stocks there.

The effects of regulation upon the production of spawn in area 2 were again observed by means of net hauls taken at sea during the winter spawning season. Analysis of these observations shows that the decline in abundance of eggs from the peak of 1936–37 was continued for the third consecutive year. While some fluctuations may be expected, due to variations in spawning conditions and spawning stocks, the occurrence of such a continuous decline must be regarded as serious. In view of the decreased catch per skate and the unfavorable trend in the size composition of the marketable sizes of fish in area 2, the decline in production of eggs indicates a decrease in the abundance of spawners in that region that may be expected to have a further unfavorable effect upon the fishery when the young produced by these spawnings enter the fishery 5 or 6 years later.

The most satisfactory explanation, at the present time, of the unfavorable trend in the area 2 stock must be the large amounts of halibut which are known to have been taken recently, both legally and illegally, in excess of the catch limit assigned to the area. It is apparent that a sharp reduction of these excess catches will be necessary to assure the maintenance of past improvements and to make possible further improvements in the condition of the stock.

The investigations of the Commission continued to measure the changes taking place in the stocks of halibut on the banks. They prove that the halibut fishery is still in a critical condition and that more effective enforcement of regulations is needed. They indicate that more intensive investigations than have been possible in recent years are necessary to guide the Commission's future actions.

## THE INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

The sockeye salmon season of 1939 was the second since proclamation of the Convention between Canada and the United States for rehabilitation of the Fraser River fishery for that species, one of the greatest of modern conservation projects.

The purpose of the Convention is to rebuild the great runs of sockeye to the Fraser River system of British Columbia. The "big" run of every fourth year until 1913 would be worth $30,000,000 at present prices, but the largest of recent years has been worth about $4,500,000. To restore these runs, the International Pacific Salmon Fisheries Commission was created, consisting of three members from Canada and three from the United States, in 1939, as follows: A. L. Hager, Chairman, Vancouver, British Columbia; E. W. Allen, Seattle, Wash.; C. E. Jackson, Washington, D. C.; A. J. Whitmore, Ottawa, Ontario; Tom Redi, New Westminster, British Columbia; and B. M. Brennan, Secretary, Seattle, Wash.

The Commission has selected Dr. W. F. Thompson as Director of Investigations.

It is provided in the understandings attached to the Convention that "The Commission shall not promulgate or enforce regulations until the scientific investigations provided for in the Convention have been made, covering 2 cycles of sockeye salmon runs, or 8 years." The first concern of the Commission during these first years has therefore been the scientific investigations, but the study of natural and artificial obstructions and the use of methods of assisting propagation have received attention.

As required by the understandings attached to the treaty, the Commission has chosen an Advisory Committee from the industry. It has also chosen a scientific council with which the Director of Investigations and staff can consult.

During 1939, the Commission met in Vancouver on July 2, 3, and 4. The midwinter meetings were held in December 1938 in Ottawa and January 1940 in Washington, D. C. The Advisory Committee met with the Commission during the July meetings. The Scientific Council met with the Director in August.

At these meetings the Commission discussed and approved the program necessary. It agreed upon the funds required, since the money appropriated by the respective Governments would decide whether this program could be carried out. Furthermore, since the expenses of the Commission are joint in character, to be discharged in equal shares by the two Governments, the smaller of the two appropriations made must be the limiting one, and it was agreed that a special effort must be made to secure the needed amount from both.

The needs of the Commission are evident from the nature of its duties. Once established, the main features of the research program must be continued from year to year until the necessary information is obtained over at least one cycle. The sockeye of the Fraser River tends to return as a 4-year-old, so that the runs occur in cycles of 4 years. The runs of each year of the four are assumed by current scientific opinion to be more or less independent, very likely composed of different "races" occupying each a home stream to which it returns. Within a 4-year cycle each such race would therefore recur and any program to determine these races, their characteristics and home streams, must cover at least 4 years. Furthermore, the initial investigations must, of course, be exploratory and preliminary, as they have been in 1938 and 1939, and it must be expected that the funds required will increase as the program matures.

During the meetings in 1939, the Commission discussed and approved the extensions of the program it considered vital for the purposes of the Convention. With the "thorough investigation into natural history" already well under way, it was considered that the remaining duties of the Commission, as stated by the Convention, should receive attention by certain extensions of its program. These extensions are those specifically called for by the Convention. They cover the adoption of methods of assisting propagation and the study of obstructions, natural or artificial, in order that recommendations might be made regarding them. The Commission unanimously decided upon, and has requested of the two Governments, the additional funds necessary to inaugurate the required engineering and biological studies. Until such are received, important phases of the duties outlined by the Convention must remain in abeyance, a fact which the formal action of the Commission emphasizes.

The investigations of the Commission were reviewed at the midwinter meeting in Washington, D. C. With special emphasis upon facts necessary for regulation, they covered the migrations of the races of adult sockeye, their abundance, rate of movement, and time of passage through salt and fresh water to their spawning grounds. The effect of obstructions upon migration, the extent and nature of the spawning grounds, and factors influencing the success and failure of spawning were surveyed.

As in 1938, sockeye were tagged at Sooke, at various places in Puget Sound and the Gulf of Georgia, and at Hell's Gate in the Fraser River canyon, for study of the migration and habits. The returns were extraordinarily high. At Sooke 1,051 fish were tagged, and 51 percent returned, as compared to 44 percent in 1938. As before, those tagged prior to the first week in July were returned from rivers other than the Fraser. Of other tagging in salt water, 6,152 fish were tagged, and 65 percent recaptured, as compared to 2,587 tagged and 47 percent recaptured in 1938. At Hell's Gate 4,344 fish were tagged and 54 percent returned, as compared to 2,128 and 27 percent in 1938. The operations were continued over the full season, instead of about half as in 1938. Analysis of the returns is underway.

At Hell's Gate the time of passage and degree of obstruction to movement were studied. The run past that point was found to be divisible into sections, each bound for a different part of the Fraser River; exceedingly valuable information for regulatory purposes.

Observers were again stationed at the canneries for sampling of the catch, recovery of tags, and gathering of statistics. Others were stationed in the several sections of the Fraser watershed to estimate and take samples of the escapement, recover tags, survey the grounds, and report on obstructions. As before, there was the closest cooperation with the officers of the Canadian Department of Fisheries.

It was obvious that despite the utmost vigilance, enumeration of the escapement by existing methods was neither accurate nor complete. Accordingly the successful experiment on a relatively simple method tried at Cultus Lake and described in last year's report was this year extended to the Harrison-Birkenhead system, tributary to the Fraser. Traps and weirs were constructed and the runs there studied closely as a preliminary to a more extensive experiment in 1940, if funds become available. It is now clear that here, as in the main river, there is a definite sequence of runs bound for different sections, and that a large proportion of the sockeye which passed were not subsequently observed in the estimation of the spawning population.

During the year a biometric study was made of the races within the Fraser and in other rivers to which sockeye caught with Fraser River fish are bound. A great mass of data was collected and has now been analyzed in part.

The experiments at Cultus Lake with methods of estimating escapement were carried further. At the same time the experiments on the control of predators and the factors influencing the survival of young, as well as their natural history, originated by the Fisheries Research Board of Canada, were continued.

The collection of statistics and materials for a general history of the Fraser River and its sockeye runs was continued on an extensive scale.

## COOPERATION WITH FEDERAL, STATE, AND OTHER AGENCIES

The Division of Fish Culture is vitally concerned in placing its product—fish and eggs—in environments where the greatest dividends will be derived from stocking. Because the Bureau's staff of biologists has been entirely inadequate to conduct surveys of all the inland waters of the United States, fish applications from individuals and clubs are submitted to more than 20 State fish and game commissions for approval before stocking the specified waters with the species requested. In some States the authorities stipulate the species, number, and size that will give best results, while in others the stocking programs have been formulated and the combined output of the State and Federal hatcheries has been budgeted to conform to these programs. The exchange of eggs and fish, especially trout (*Salmonidae*) and related species, has been of mutual benefit in a number of States.

In view of the tremendous amount of angling in the waters within the national forests, there has been close cooperation between the Forest Service of the Department of Agriculture and the Bureau in an effort to maintain good fishing in those areas. More than 20,449,000 fish were assigned to the Forest Service for the stocking of suitable waters during the past year. Trout-rearing units were operated in the Chattahoochee, Natahala, Pisgah, Allegheny, Huron, Marquette, Chequamegon, and Superior National Forests, and approximately 1½ million trout were reared to large fingerling, or legal size before liberation.

The Bureau continued to cooperate with the National Park Service in the restocking of waters under its control. It appears that an all-time record will be established with regard to the number of blackspotted trout eggs collected from waters in Yellowstone Park this season.

In the Tennessee Valley area, 3-way agreements between the Bureau of Fisheries, the Tennessee Valley Authority, and the States of Alabama, Tennessee, and North Carolina have been made effective. The Tennessee Valley Authority has completed a pondfish hatchery having a water acreage of 111 acres on the Elk River in Alabama. The personnel assigned to that hatchery is now collecting brood stock and treating the pond bottoms to reduce the loss of water though seepage. The hatchery operated at Norris, Tenn., was enlarged during the year. The State conservation departments will distribute the fish produced at these units for the stocking of waters in that part of the Tennessee Valley area within their respective State boundaries.

The New Jersey Board of Fish and Game Commissioners donated the services of its staff for the surveying of potential Federal pondfish hatchery sites in New Jersey. Further assistance was received from various State agencies in setting up W. P. A. projects to cover extensive construction programs at Federal hatcheries.

The Bureau of Reclamation has continued its efforts to preserve the runs of salmon in the Columbia and Sacramento Rivers, where the survival of this species is threatened by huge dam-construction projects. In connection with this work, one of the four salmon hatcheries originally contemplated has been partially completed and placed in limited operation.

## CONSTRUCTION ACTIVITIES

The major part of fish-hatchery construction during the year was in continuation of projects previously started. The 1940 appropriation carried funds for the establishment of hatcheries in Illinois and New Jersey, a substation in Maine, and/or the enlargement of the East Orland (Maine) Hatchery. Difficulty in selecting a site, and absence of State enabling legislation, prevented any action in Illinois. In New Jersey it was not possible to obtain a suitable site at a price low enough to permit adequate development.

A site near Salem, Maine, was selected for a small trout-rearing and bass-cultural unit, and the title was cleared late in the year. Construction of this unit was not started prior to June 30. At the East Orland station, buildings and ponds were rehabilitated and provision was made for resumption of the propagation of Atlantic salmon.

All of the appropriations for the above projects were continued available and none of the projects were abandoned.

At the start of the year previously approved hatchery projects at Hebron, Ohio; New London, Minn.; and Farlington, Kans., entered a more active phase of construction. At the two former, appropriated funds were supplemented by W. P. A. allotments, with a large work camp assigned to New London. Construction of the Kansas project was retarded by adverse weather conditions, and none of the establishments were developed to the point where fish-cultural work could be undertaken at the close of the year.

Toward the end of the 1939 fiscal year, allotments of P. W. A. funds were made available which provided $30,000 for the construction of a bass hatchery at Carbon Hill, Ala., and $60,000 for the development of fish-cultural facilities in Yellowstone Park. Of the latter sum, $20,000 was reallocated for the construction of the Glacier National Park hatchery at Creston, Mont. With the exception of the Yellowstone Park project, these jobs were nearing completion at the end of the year. The construction of the Glacier Park hatchery was taken over by the Bureau when the project was in an incomplete status. This work was initiated by the National Park Service, and upon the exhaustion of funds available to that agency it was necessary for the Bureau to assume the responsibility for completion.

W. P. A. allotments totaling $188,047 were allocated to 20 fish-cultural stations for repairs, improvements, and further developmental work. Among the projects undertaken was the construction of four rearing ponds at Moorefield, W. Va., to serve as an auxiliary to the Leetown (W. Va.) Station. This allotment supplemented the regular construction appropriations. Seventeen projects of a similar nature, which had been financed by W. P. A. allotments during the previous year, were continued in operation until these funds were expended. In addition, several W. P. A. projects were approved under State quotas covering similar work. The flexibility permitted under the procedure of transferring W. P. A. funds to the Bureau has been of great value in meeting unforeseen contingencies at the numerous field stations.

## JAPANESE ACTIVITIES IN BERING SEA

As was the case during a number of previous seasons, the Japanese training ship *Hakuyo Maru*, of the Tokio Fisheries Institute, made a cruise in North Pacific waters. She visited St. Paul Island on July 11 and 12, thus giving the students a chance to become familiar with fur-seal operations at the Pribilof Islands.

Crab-fishing operations were conducted again in the season of 1939 by the Japanese vessel *Toten Maru*, accompanied by 3 self-navigating tenders and carrying 10 launches. The chief place of operation was in the open sea between 55° and 57° north latitude and between 163°30′

and 168° west longitude. These operations were discontinued by the middle of May and did not interfere with the salmon fishery in that region.

## ALASKA FISHERIES SERVICE

### ADMINISTRATION OF FISHERY LAWS AND REGULATIONS

Operations in the Alaska fishery industry were observed closely in all areas by field agents of the Bureau, and regulations with respect to commercial fishing were modified during the progress of the season, as circumstances warranted, to permit the fullest possible utilization of the fishery resources consistent with conservation requirements. The Acting Commissioner of Fisheries spent several weeks in the Territory studying problems of fishery management. Following the close of the fishing season he initiated the policy of holding annual hearings in the various fishing centers in order to obtain the views of those engaged in the industry with regard to regulatory measures.

Revised regulations for the protection of the commercial fisheries of Alaska were issued by the Secretary of the Interior on January 4, to be effective in the 1940 season. The new regulations were based upon the evidence presented at the Alaska hearings and in supplemental briefs, as well as upon data gathered by the Bureau's patrol force and biological investigators. Commercial salmon fishing in the Bristol Bay area was restricted to approximately 50 percent of normal operations for the purpose of rebuilding the weak cyclical run of red salmon which occurs in this area in the years divisible by five. The weekly closed period was increased to 60 hours in the Prince William Sound area and in most sections of southeastern Alaska, in order to provide a more continuous escapement of pink salmon throughout the season. In the southeastern Alaska area commercial fishing for herring was prohibited except by gill nets or for bait purposes, and in the Prince William Sound and Kodiak areas herring-catch quotas were established to prevent depletion. Other changes in the regulations included slight modifications of seasons, limitations upon the size of nets, and restrictions upon waters open to commercial fishing. One feature was the closure of 20 salmon fish-trap sites previously open to this type of apparatus.

Separate regulations were issued on May 28, 1940, with regard to the protection of game fish and other fish in the fresh waters of Alaska, as distinct from the regulations pertaining to the commercial fisheries. The publication of separate sport-fishing regulations was found advisable in view of the rapid development of sport fishing in the Territory in recent years. The new regulations define game fish and establish limitations on the time, means, methods, and extent of sport fishing in the fresh waters of Alaska.

A congressional investigation of the Alaska fisheries was begun during the summer of 1939 by a subcommittee of 7 members of the Committee on Merchant Marine and Fisheries. The subcommittee was assisted by a joint committee of 4 members from the Territorial legislature. This investigation was concerned primarily with the use of traps in catching salmon, the advisability of maintaining or changing the prescribed fishing seasons, the effect of herring fishing operations upon the salmon fishery, offshore fishing by foreign nationals for crabs and salmon, and other matters concerning the conservation of the fisheries of Alaska and a reasonable development of the fishing industry.

The congressional committee held public hearings at nine important fishing centers in Alaska and one hearing in Seattle, Wash., in the course of the investigation. At each hearing supplemental statements and briefs were invited, and these, together with much additional information of a factual nature, were made a part of the record of the hearings. A report of the investigation, together with recommendations of the committee, was published as Report No. 2379 under date of June 5, 1940.

Dr. Carl L. Hubbs, of the University of Michigan, was engaged to make a special investigation of the fisheries of Alaska on behalf of the Secretary of the Interior in the season of 1939. Dr. Hubbs covered the Territory widely, including a visit to the Pribilof Islands, and upon his return in the fall submitted an exhaustive report.

Under the authority granted by the act of August 2, 1937, for the protection of oyster culture in Alaska, a 6-year lease was executed for 100 acres of bottoms in Alaska. This is the third such lease to be executed under the act. An output of 52 gallons, or 455 pounds of oysters was produced in the Ketchikan district in 1939. This is the first reported commercial production of oysters in Alaska waters, although there has been some experimental cultivation since 1931.

A patrol of the fishing grounds was maintained by 14 Bureau vessels, 1 chartered vessel, 5 speedboats of the Bureau, and numerous small craft. As in previous years, chartered airplane service was used to some extent to supplement the vessel patrol, and also for surveys of spawning grounds and transportation of officials to isolated districts. One hundred and seventy-eight persons were identified with fishery law-enforcement work, including stream guards, weir operators, crews of patrol vessels, wardens, and biologists.

In a few isolated regions, funds provided by the Territorial legislature and by local fishery operators were used to continue the payment of bounties on predatory trout that feed upon salmon eggs and fry. This work is administered by the Bureau in connection with the regular patrol of fishing grounds. Studies of the Dolly Varden trout were continued in the Kodiak area, and considerable numbers of these predators were destroyed by employees in charge of salmon-counting weirs.

## PRODUCTS OF THE FISHERIES

The total production of the Alaska fishery industry in 1939 was somewhat less than in the previous year, notwithstanding an increase in the number of plants and persons employed in the industry. The total output was 368,536,000 pounds, valued at $40,104,000, as compared with 446,664,000 pounds, valued at $42,870,000, in 1938. The estimated value of the 1939 catch to the fishermen was about $11,321,000, or approximately $719,000 less than in the preceding year. There were 30,572 persons employed in the various branches of the industry, as against 28,084 in 1938.

Salmon products represented 73 percent in volume and 91 percent in value of the total fisheries output in Alaska in 1939. Ninety-three percent of the salmon products consisted of canned salmon, the pack amounting to 5,263,000 cases, or 252,631,000 pounds, valued at $34,441,082. Red salmon comprised 37 percent and pinks 48 percent of the total pack of canned salmon, as against 37 percent and 47 percent, respectively, in 1938. As compared with the pack in the preceding year, the output of canned salmon in 1939 showed a decrease of about 23 percent in quantity and about 6 percent in value. One hundred and nine canneries were operated in Alaska in 1939, or 11 more than in the previous year, and the number of persons employed in the salmon-canning industry increased from 22,280 in 1938 to 24,921 in 1939.

There were 21 herring plants operated in 1939, as compared with 17 in the previous year. Products of the herring fishery were valued at $2,090,000, an increase of about 2 percent over 1938. Halibut landings were slightly less in 1939 than in the previous year, and many of the minor fishery products, including clams, shrimp, and crabs, also were less than in 1938.

## ALASKA FUR-SEAL SERVICE

### General Activities

Sealing and foxing operations were carried on as usual by the native inhabitants of the Pribilof Islands under the supervision of the Bureau's staff. Approximately 80 additional natives from the mainland and Aleutian Islands were employed during the summer to assist with fur-seal activities, and 25 employees of the Fouke Fur Co. also were detailed to the islands for several months to assist in the curing and packing of the skins.

The byproducts plant on St. Paul Island was in operation again, rendering oil and meal from seal carcasses and blubber. The total production for the season amounted to 32,809 gallons of oil and 502,914 pounds of seal meal. Small quantities of these products were retained at the islands to be used for fox food, but most of the oil and meal was shipped to Seattle for disposition. About 75 tons of seal meal was delivered to the Division of Fish Culture for use in Federal fish hatcheries, and the surplus meal and oil were sold through competitive bidding for the account of the Government.

Four new frame houses were built for natives on St. Paul Island, and a new machine shop was almost completed. Other improvements included an addition to the boatways, the erection of a small pumphouse, and the building of a reindeer corral. On St. George Island a new bunkhouse for natives was completed.

Annual supplies for the Pribilof Islands were transported from Seattle aboard the U. S. S. *Capella*, through the cooperation of the Navy Department. The Coast Guard also rendered valuable cooperative service in patrolling waters of the North Pacific and Bering Sea for the protection of fur seals and sea otters, and in giving other assistance in the Bureau's work.

The entire season's take of sealskins was shipped to St. Louis, Mo., to be processed and sold at public auction by the Fouke Fur Co. for the account of the Government, under the terms of the contract of June 9, 1939. In accordance with the terms of the fur-seal treaty of 1911, Japan will receive a 15-percent share in the proceeds of sale, and Canada will receive a like share. The Government of Canada discontinued the previous arrangement for taking delivery of the skins in kind.

The United States received a shipment of 210 Robben Island fur-seal skins, or 10 percent of the number taken by Japan in 1939. This represents the annual share due this country under the terms of the fur-seal treaty. The Department's selling agents at St. Louis, Mo., received the skins for processing and sale.

### Seal Herd

The total number of animals in the Pribilof Islands fur-seal herd as of August 10, 1939, was 2,020,774. This is an increase of 148,336 over the computed number in the preceding year.

### Take of Sealskins

In the calendar year 1939 a total of 60,473 fur-seal skins were taken on the Pribilof Islands, or 2,109 more than in the preceding year. Of the total number 47,646 were taken on St. Paul Island and 12,827 on St. George Island. Insofar as possible the killings were confined to 3-year-old males, and a sufficient reserve of this age-class was left for breeding stock.

### Sale of Sealskins

In the fiscal year 1940 two public auction sales of fur-seal skins were held at St. Louis. At the sale on October 2, 1939, a total of 21,764 Pribilof Islands sealskins sold for a gross sum of $463,338.25. The sale included 8,030 skins dyed black, 8,516 dyed Safari brown, 5,100 dyed Matara brown, and 118 raw and partly processed skins. Matara brown is a recently developed color which was offered at this sale for the first time and proved very popular. On April 1, 1940, a total of 28,749 Pribilof Islands sealskins sold for a gross sum of $585,687. This sale included 9,599 skins dyed black, 9,595 dyed Matara brown, and 9,555 dyed Safari brown. In addition, 210 sealskins from Japan and 2 confiscated skins brought $3,150.75.

Sealskins disposed of at private sales, under special authorization by the Secretary of the Interior, consisted of 277 dyed black, 170 dyed Safari brown, 265 dyed Matara brown, and 32 raw-salted skins, which brought a total of $17,224.89. In all, 51,469 fur-seal skins were sold for the account of the Government in the fiscal year 1940 for a total gross sum of $1,069,400.89.

### Foxes

The management of the blue-fox herds on the Pribilof Islands continued to be one of the important activities. During the winter of 1939–40 a total of 1,258 fox pelts were taken, including 377 blue and 8 white pelts from St. Paul Island, and 869 blue and 4 white pelts from St. George Island. Sufficient stocks were reserved for breeding purposes on both islands.

In the fiscal year 1939 there were sold at public auction 1,018 blue- and 11 white-fox skins taken on the Pribilof Islands in the 1938–39 season. The blue pelts brought $17,001.50, and the white pelts brought $143, a total of $17,144.50.

### Fur-seal Skins Taken by Natives

The privilege of taking fur seals at sea is granted to aborigines dwelling along the Pacific coast, under provisions of the North Pacific Sealing Convention of July 7, 1911, although such sealing is restricted to primitive methods. In 1939 Indians under the jurisdiction of the United States took 61 fur-seal skins, and Indians under the jurisdiction of Canada took 576 sealskins, all of which were duly authenticated by officials of the respective Governments.

### Fur-seal Patrol

Ten vessels of the Coast Guard were instrumental in enforcing the laws and regulations for the protection of fur seals and sea otters in the North Pacific and Bering Sea. One vessel of the Bureau of Fisheries also was assigned to patrol waters off the coast of Washington during the period of sealing operations by the native Indians.

### Protection of Sea Otters, Walruses, and Sea Lions

Regulations for the protection of walruses and sea lions were continued in effect without change. The capture of these animals is permitted only under certain limited conditions. Sea otter investigations were made at the Amchitka substation, and for the first time observations were continued throughout the year. The killing of sea otters is prohibited at all times.

## PROPAGATION AND DISTRIBUTION OF FOOD AND GAME FISHES

While subsequent revision may alter the totals slightly, it is evident that the output of fish and eggs at the Federal hatcheries during the fiscal year 1940 approximated 7,400,000,000. In comparison with the 8,042,000,000 production of the previous year, there was a reduction of approximately 7.9 percent, or 640,000,000 fish and eggs. This drop is in part attributed to a curtailment in production of cod, haddock, and flounders. Activity with this group is governed by weather conditions, and the intensity of local commercial fishery operations. Both of these factors were adverse during the winter of 1939–40, with a consequent retarding of the hatchery functions.

The principal reason for the apparent slowing down of Federal fish-cultural work was the fact that the production of whitefish and pike-perch, hitherto shown as derived from the Put in Bay (Ohio) Station, was dropped from the records. This work was taken over by the Division of Conservation of the State of Ohio, preparatory to the formal transfer of the hatchery property to the State, as authorized by Congress. This station produced its usual quota of these two species but is listed as a State activity, and its output is omitted from the Federal records. This situation was, therefore, responsible for a reduction of 340,000,000 fish and eggs as reported by the Bureau of Fisheries, although the hatchery continued its service to the fishing industry.

As a matter of fact 24 different species were distributed in increased numbers, among them 6 species of trout and one variety of Pacific salmon. Increases were also registered for shad, striped bass, buffalofish, and lobster. There was a reduction of approximately 1,000,000 in the output of the black basses, which are also subject to adverse weather conditions during the spawning season. Some 45 different species were handled at the various hatcheries.

Despite the reduction in the total output there was little change in the actual number of the fingerlings and larger sizes of game fish. It is gratifying to note that the production of game and pan species amounted to 151,723,000, an actual as well as proportional increase. These forms comprised 2.5 percent of the total output, but it must be recognized that practically all of the species propagated are sought for recreation at certain times or places.

As maintenance of a continuing stock of food fishes, particularly in coastal waters, contributes to a stable economy, and as maintenance of a well-grounded recreational asset in the form of angling contributes to a sound morale, the Department's fish-cultural functions have made their contribution to the basic elements of national defense.

## PROPAGATION OF COMMERCIAL SPECIES

Stormy winter weather prevailing off the New England coast limited the activities of the smaller commercial fishing craft operating in the inshore waters. The spawntakers based at the hatcheries at Gloucester, Mass., and Boothbay Harbor, Maine, were therefore unable to obtain and fertilize the usual quantity of cod and haddock eggs. During the pollock season conditions were more favorable, resulting in an increased rate of salvage for this species. At Woods Hole, Mass., there was difficulty in obtaining an adequate supply of spawning flounders, resulting in approximately 50 percent reduction in the egg collections. Experiments in planting the flounder fry in Narragansett Bay and Long Island Sound were continued, though on a reduced basis.

At Boothbay Harbor, Maine, improved production of fourth-stage lobster fry was attained by heating the water supply for the hatchery. This practice was intensified in handling the lobster hatch during the summer of 1940, and was adopted at the rearing plant maintained by the State Department of Sea and Shore Fisheries.

The aggregate output of fish and eggs from these three stations exceeded six and one-half billion, of which over five and one-half billion comprised fertilized eggs recovered as a salvage measure.

*Pacific salmon.*—Exhaustive investigation by Bureau biologists, and the report of an independent board of consultants, has indicated that enlarged hatchery operations will constitute one of the most important elements in a plan for maintaining the run of salmon in the Columbia River. There is evidence that the same conclusion may be reached with reference to the Sacramento River in California. The mammoth hatchery developments under construction by the

Bureau of Reclamation in and near Leavenworth, Wash., were not in full operation at the close of the year. It was expected, however, that part of the 1940 run of salmon would be handled at this plant.

The existing salmon hatcheries located on the Rogue River, on Puget Sound, and at Quinault, Wash., as well as on the two rivers mentioned above, produced an aggregate output somewhat less than the previous year. The greatest reduction was with the chinook salmon, the difference being 13,000,000. Fewer chum salmon were propagated. There was a slight increase in the output of silver salmon, with the production of the valuable sockeye species practically unchanged. Nearly one-half million humpback salmon were provided, this being the year for the 2-year cyclic run of this species.

The salmon hatcheries also propagated steelhead trout and were successful in doubling the output of this much-sought game fish. The hatchery at Little White Salmon, Wash., has been in process of reconstruction during the year, and minor improvements, mainly new ponds, were developed at several other points. Hatcheries at Mill Creek and Battle Creek, Calif., were inundated during the floods which visited the Sacramento Valley, but damage to property was negligible and loss of fish was slight.

*Anadromous species, Atlantic coast.*—For the second successive year the production of shad was increased, totaling 42,000,000 in comparison with 34,000,000 during the previous year. The James and Chickahominy Rivers in Virginia were served by the pondfish station near Roxbury, Va., where previous attempts at shad culture had been largely unsuccessful. Experiments in the rearing of shad fry in ponds were continued, the results indicating that this practice may be a valuable supplement to present methods when suitable ponds are available. Yellow perch and white perch were also propagated at the shad stations on the Potomac River and Albemarle Sound. A production of almost 6,000,000 striped bass fry at the hatchery on the Roanoke River in North Carolina represents the highest level attained with this species in many years.

Of outstanding interest is the resumption of the propagation of Atlantic salmon in Maine. After working out preliminary plans in cooperation with the Maine Department of Inland Fish and Game, the facilities of the East Orland Hatchery were improved. A few thousand salmon eggs were obtained from the Dennys River run in the fall. These were hatched and are being reared to fingerling size before planting. During the spring approximately 100 migrating salmon were taken from the fish ladder at Bangor, Maine, and transferred to a holding pool prepared at the hatchery. Losses of injured fish were slight, and at the close of the year this relatively small stock of brood salmon was in good condition and prospects were favorable for the collection of several hundred thousand eggs. While the work is of limited magnitude in comparison with the scope of the activity in earlier days, there is every reason to hope that the restoration of the Atlantic salmon is definitely under way.

*Commercial species, interior waters.*—With the transfer of the Put in Bay (Ohio) Hatchery activities to the control of the State of Ohio, the culture of Great Lakes species is markedly limited. A limited number of lake trout, whitefish, and lake herring eggs were obtained for the Cape Vincent, N. Y., and Duluth, Minn., stations. At the latter point most of the lake trout eggs were supplied by the State of Michigan. The State also supplied lake trout fry which were transferred to the Charlevoix (Mich.) Station, which has been reconditioned as a rearing unit. Losses were heavier than was anticipated, and the fingerlings were released before they had attained the desired growth. However, the effort was repeated during the spring of 1940, and at the close of the fiscal year approximately one-half million lake trout fingerlings were thriving and growing rapidly. It is believed that the planting of lake trout at a larger size will, to a large extent, compensate for smaller numerical output.

The production of pike-perch was only a small fraction of the output of previous years, the reduction being due to the transfer of the hatchery on Lake Erie which has produced the bulk of the eggs of this species. Aside from the Great Lakes species, the commercial fishes of interior waters comprise mainly the carp, buffalofish, and catfish. Since the supply of carp appears to be holding up well, no effort was made by the Bureau to propagate that species during 1940. In the case of buffalofish and catfish there was a significant increase in the plantings of eggs and fish. The buffalofish were planted almost entirely in the Upper Mississippi area.

*Game species.*—Inasmuch as the game and pan species of interior waters are subject to angling exploitation of increasing intensity, special attention was given to the culture of these species. All varities of trout were distributed in larger numbers, and in many instances in larger sizes. It has been recognized that smaller local waters, farm ponds, and State and county parks, if well stocked with common panfish, present a recreational asset of great importance to a very large part of the population. Consequently the production of the sunfishes, catfishes, and lesser game fishes has been augmented for the purpose of maintaining a supply of fish in waters which may not be frequented by the more ardent angler. Most of the new hatchery developments have been planned with this object in mind. Certain advances and improvements have been effected in hatchery technique, but the actual stocking of the waters themselves remains the principal function in which effectiveness can be increased.

At the close of the year the Bureau assumed responsibility for a trout hatchery and rearing unit constructed by the Forest Service on Warm River, Idaho. The site is considered one of the best in the Western United States. A few Dolly Varden trout were propagated, although its low esteem by the anglers discourages any general attempt to increase its abundance. Efforts of several years duration to establish the smallmouth bass in the Southwest appear to have been crowned with success, although additional time will be required for the species to become abundant. The Bureau has continued to experience a shortage of Loch Leven trout, following the virtual elimination of the egg supply previously obtained from the Madison River in Montana. Substitution of a domesticated brown trout stock has been resorted to as a means of overcoming the deficiency. One of the railway distribution cars was retired from service during the year, since the fleet of distribution trucks has been built up to a point where transportation by highway largely supplants movement by rail.

A new demand for warm-water fish has developed as a result of the program of farm pond construction sponsored by the Soil Conservation Service. Although these requirements and the demands for stocking other waters under direct Federal control have been given priority, the percentage of unfilled applications from private individuals and organizations has remained at a low level.

Shipments of rainbow trout eggs were made to Puerto Rico, Hawaii, and to the Republic of Colombia. A successful hatching season during the winter and spring provided an excellent stock of young fish which were being held for rearing and subsequent distribution at most of the stations at the close of the year.

*Upper Mississippi Wildlife and Fish Refuge.*—The traditional salvage or rescue of stranded fishes in the overflow areas was virtually terminated. The Bureau's policy of constructing propagating ponds at suitable points within the refuge was fully justified by the production achieved at Genoa, Wis., Guttenberg, Iowa, and several other points. The yield of bass was so great during the summer of 1939 that distribution facilities were taxed to the limit. The 1940 hatch was not as heavy, but the production was of great value in maintaining the supply of fish in the great recreational areas in Minnesota and Wisconsin. In addition to this type of fish-cultural work, the headquarters station at LaCrosse, Wis., also provided a large quantity of trout for the same areas.

## DIVISION OF FISHERY INDUSTRIES

The Division of Fishery Industries is concerned with the activities and welfare of the commercial fisheries and fishery industries. Its work includes the planning, supervising, and conducting of: (1) The Fishery Market News Service; (2) fishery statistical surveys; (3) investigations in fishery technology; and (4) investigations in fishery economics and marketing, including the administration of the Fishery Cooperative Marketing Act.

Studies and investigations are planned particularly to promote the more orderly marketing of fish and shellfish, to develop commercial uses for little-known or little-used fishery products, and new uses for the better-known species and commodities, and to improve the technology of capture, manufacture, handling, and marketing. This work tends toward the elimination of waste in marketing, and greater utilization of the fishery harvest. Consequently, it accomplishes an important function in conservation. This is imperative, since obviously haphazard and wasteful marketing and technological practices result in a greater drain on the resource for the same volume entering consumption. Thus, the types of activities conducted are of great value in maintaining the important food and industrial resource represented by fish and other aquatic forms, particularly in view of the possibility of a national emergency.

### FISHERY MARKET NEWS SERVICE

Essentially, the fishery market news service constitutes the exchange of market information between the fishermen or producers in the fishing areas, and the middlemen in the terminal markets, with the Bureau of Fisheries acting as the exchange agency; that is, the agency for collecting and disseminating market information. The Market News Service now maintains six field offices from which daily reports are issued. These are located at New York, N. Y.; Boston, Mass.; Chicago, Ill.; Seattle, Wash.; Jacksonville, Fla.; and New Orleans, La. The locations of these field offices have been so carefully chosen that the current data collected and disseminated through them cover some phase of the marketing of about one-half of the 3,000,000,000 pounds of fish and shellfish taken annually for food in the United States and Alaska.

New York City was selected for the first Market News office, since it is the center of this country's most important consuming area and the market to which fishery commodities are shipped from all parts of this Nation and from foreign countries. This market exercises considerable influence over production and prices of fishery products throughout the country.

The choice of Boston for a Market News office was due to its importance as the center of New England's valuable fisheries and as a port of landing for large quantities of fish. Thus, Boston is primarily an office for the reporting of production.

Chicago is probably the most important inland market for fishery products. Much of the harvest of fresh-water fish from the Great Lakes and other interior waters is shipped to this city's wholesale market for distribution. Chicago also receives large quantities of Eastern haddock and rosefish, Western halibut and salmon, Gulf coast shrimp and red snapper, and large quantities of Canadian fresh-water varieties.

Seattle is of importance particularly as a landing port for the halibut fisheries of the Pacific Northwest. It also is of importance as a port of landing for salmon in the fresh and frozen fish trade and for other species common to the Pacific coast.

Jacksonville is of importance as an assembling, distribution, and shipping center through which most of Florida's fish pass when destined for northern markets. Consequently, market information emanating from this office is of greatest value to both northern and southern producers, shippers, and dealers.

New Orleans is the largest centrally located city in the Gulf States, which are important in the production and distribution of many fishery commodities; particularly shrimp. Consequently, this city offers unusual facilities for the collection and dissemination of valuable fishery market news data.

In addition to the coverage of market news in these producing, consuming, or distribution centers, the daily releases from each office are augmented by pertinent data telegraphed to it from the other offices, as well as from market news reporters located at important producing points along the coasts.

During the past year the Market News Service has completed arrangements for the daily broadcasting of market news information from radio stations at Boston, Chicago, Jacksonville, and New Orleans, and is making arrangements for similar broadcasts in other cities. Periodic market news reports also are prepared and disseminated from the Washington office. These include summarized data made available through the daily and monthly reports of the field offices as well as articles relating to the commercial fisheries and other related information.

## STATISTICAL INVESTIGATIONS

The collection of fishery statistics was one of the earliest activities of the Bureau of Fisheries, and the supplying of these data has continued to be a major function. Fishery statistics are collected to serve biological and economic purposes. Since the fisheries are usually prosecuted in areas not under private ownership, the problem of their conservation is of national concern. It therefore is important that the Federal Government keep close watch over the condition of the various fisheries in order that depletion may be anticipated in time that remedial measures can be successfully taken. Thus, current statistical data must be obtained on the yield of our fisheries. These figures furnish the biologist with the background from which he estimates future trends and yields. In addition to their value in the conduct of conservation studies, the Bureau's statistical surveys form the basis for information of greatest importance to guide the fishery trade in the conduct of its business activities.

*Sectional surveys.*—The basic statistical surveys are those for the various geographical sections. These cover complete statistics of the volume of the catch of fish and its value, employment in fishing, quantity of fishing gear used, number and classification of fishing and transporting craft, employment in wholesale and manufacturing establishments, and the volume and value of manufactured fishery products and byproducts. The first comprehensive survey of this type was made for the year 1880. Surveys following 1880 until recent years were periodic, or covered a limited number of States or areas in any single year. Currently, however, complete statistical surveys of the commercial fisheries in all marine and lake sections are being made. Detailed tabular statements based on the sectional surveys are published annually.

*Landings at certain important United States ports.*—In addition to the basic sectional surveys, the Bureau also conducts various local or special surveys. These include the daily collection of data on the landings of fishery commodities by fishing vessels at the ports of Boston and Gloucester, Mass.; Portland, Maine; and Seattle, Wash. Statistical data for the New England ports are recorded according to the fishing areas from which the catch is taken and gear used in capture. Consequently, this information is most important in following the trend of the yield of the important North Atlantic species. Data on daily landings at Seattle are of equal importance in following the trend of the fisheries for halibut and other North Pacific forms. Data on these landings of fishery products are published monthly.

*Shad and alewife fisheries.*—Shad once entered the streams of the Atlantic coast, on their spawning migration, in much greater numbers than they now do. Two of the most important streams of present spawning migrations are the Hudson and Potomac Rivers. Consequently, in order that detailed data may be available for the study of these fisheries, annual surveys are made of the production of shad in these rivers. Annual surveys are also made of the catch of alewives in the Potomac River.

*Canned fishery products and byproducts.*—Since 1921 annual surveys have been made to collect statistics on the production of canned fishery products and byproducts of the United States and Alaska. These data are of importance to the industry as a guide in their manufacturing activities. This information is published annually.

*Cold-storage holdings of fish.*—Through the cooperation of the Agricultural Marketing Service, Department of Agriculture, statistics are collected and published monthly on the cold-storage holdings of fishery products and quantities frozen by important species or groups of species. These figures are shown separately for major geographical sections. Since holdings of fishery commodities in cold storage represent a considerable portion of the available supply of fishery commodities on hand at any one time, these data are eagerly sought by the fishery industry. Monthly cold-storage bulletins are published.

*Sponge market, Tarpon Springs, Fla.*—The domestic sponge fishery is confined to the State of Florida, and a large part of the production is sold through the Sponge Exchange at Tarpon Springs. In view of the importance of this exchange in the total domestic sales transactions of the industry, the Bureau obtains and publishes statistics of the quantity and value of sponges by variety classifications which are handled through the exchange each year.

## TECHNOLOGICAL INVESTIGATIONS

The principal objective of fishery technological investigations is to increase the economic value of the aquatic harvest by more complete and efficient utilization. Toward this end studies are conducted of the technical phases of fish production, processing, and marketing. In planning these studies efforts are made to select those which have the broadest fundamental application. The value of technological investigations does not end with their application to the fishing industry, as other American industries also make extended use of the results of this work. For example, the Bureau pioneered in this country in the development of quick-freezing methods as adaptable to the preservation of fishery products. These methods now have widespread application in the preservation of fruits, vegetables, poultry, and meat. In another instance, a search for new sources of vitamins A and D was conducted and it was found that oils from many species of fish are rich in these vitamins. A direct outgrowth of these investigations is the production of oils having a high vitamin content from the livers and viscera of various species of fish such as halibut, tuna, and swordfish. This work has resulted not only in raising the income of the fishery industries through the sale of products heretofore wasted, but it also has been most valuable to the drug industry. Of outstanding importance, however, is the contribution of this work to the health of our people by providing an economical and convenient source of vitamins A and D.

It should be pointed out that technological work, through studies which promote the greater utilization of domestic aquatic forms and through the development of new uses for these commodities, is making the people of the United States less dependent upon foreign sources, which is vitally important in view of present world conditions.

Specifically, the technological work of the Bureau during the past year has dealt with problems in the preservation of fishery products for food, in the manufacture of fishery byproducts, and in the nutritive value of aquatic products in general.

*Preservation of fishery products for food.*—Studies on the preservation of fishery products for food are conducted in the fields of chemistry, biology, and engineering. Their purpose is the improvement of the quality of fishery food products; the development of scientific tests for judging the quality of fishery products; the development of methods for further improving sanitary conditions in fish-packing plants; and the development of additional fresh, frozen, cured, and canned fish foods. During the past year there were many requests for research on problems of this type. This is indicative of the desire of the fishery industry to place on the market food products which will meet the most exacting requirements as to quality and wholesomeness, and to make the most effective use of the fishery harvest. Not only has the fishery industry been instrumental in having these studies conducted, but it has been quick to adapt to commercial practice many of the recommendations resulting from this work.

*Manufacture of fishery byproducts.*—Investigations in the manufacture of fishery byproducts have been particularly concentrated on the economic utilization of salmon cannery trimmings and fish livers and visceral organs; the preparation of fish meals of improved nutritive value; the problems of the storage of fish meal; oxidation of fat in fish meal; and the solubility of fish proteins.

*Nutritive value of aquatic products.*—Studies on the nutritive value of aquatic products have always occupied an important place in the fishery technological investigations because the food value of a product ready for marketing is, in most instances, the true yardstick or measure of the value of a new method of processing or an improvement in existing methods in the industry. For example, assuming that costs of processing are equal in each case, if a new method of manufacturing fish meal or a new method of freezing fish fillets produces a finished product of better quality, measured in terms of food value, then that is a true estimate of its worth or justification for its commercial application.

The problems undertaken in this field during the past year have been concentrated on determination of the nutritive value of the edible portion of fishery products, more particularly the biological value of the protein. Considerable effort has also been expended on evaluation of the feeding value of fish meals and a study of changes resulting from conditions of processing and storage.

Study was also made of the biological value of the protein of salmon taken under different physiological periods such as prior to migration, during migration, and, finally, spawning. Acute and chronic toxicity tests with certain kelp products, Irish moss, and agar, have also been carried out.

## ECONOMIC AND MARKETING INVESTIGATIONS

There was a constant demand throughout the year for economic studies of the various phases of the commercial fisheries and the marketing of fishery commodities. The limited facilities of the Bureau make it possible to conduct only a very limited number of large-scale studies of these types. During the past year, however, a rather extensive survey of the retailing of fresh and frozen fish was made. Data thus far reviewed show that the volume of sales for fish was small for most of the stores surveyed. The sales of nearly 40 percent of the 4,000 retail stores handling fish, which were included in the survey, averaged less than $100 per week during 1938. For about 30 percent of the stores, sales of fish averaged between $10 and $29 per week and less than 30 percent reported fish sales in excess of $29 per week. The 4,000 stores handling fresh fish were located in both commercial and residential sections of about 50 representative cities in the eastern section of the United States. Included among these stores were nearly 1,200 chain stores, over 2,000 independent stores and voluntary chain stores, and about 400 fish markets. Preliminary results of the study indicate that very few stores have extensive facilities devoted to fish sales. Frequently fish are handled on only two or three days of each week, and on these days fish are allocated a small part of the space usually occupied by meats. A large percentage of the stores reported that the fish business is profitable, and some operators indicated that fish was the most profitable item handled. However, many owners and managers of stores evidenced little interest in fish sales and consequently devoted little effort to promote this phase of their business.

It is expected that a great deal of information valuable to retail fish dealers and allied interests will become available upon the completion of the tabulation and analysis of the large volume of data collected in the course of this survey.

Work in connection with the administration of the Fisheries Cooperative Marketing Act was continued during the year. Such work particularly took the form of collecting, analyzing, and disseminating information. This unit of the Bureau offers an advisory service to fishermen who are considering the desirability of forming cooperatives.

Other studies relating to the economics of the fisheries or the marketing of fishery commodities conducted during the year included investigations of the surplus-fish situation; a compilation of the magnitude of the commercial fisheries of the world; the assembling of data on the commercial fisheries as a source of employment; a study of the significance of byproducts to the fishery industries; a review of the rosefish fishery of New England; and studies of such specific fisheries or industries as the Chesapeake Bay soft-crab industry, the shark fishery of the South Atlantic coast, and the Pacific coast oyster industry.

## BIOLOGICAL FISHERY INVESTIGATIONS

The primary purpose of all biological fishery investigations is to insure a continuing supply of fish and shellfish for food and industrial purposes. The measurement of the drain on existing resources, the determination of withdrawals that may be made without endangering future supplies, and the development of devices or procedures to protect undersized fish from wasteful and destructive methods of fishing are of fundamental importance from the standpoint of conserving an important food resource. In time of war or threatened war increased exploitation of the fisheries is inevitable. The progress of fishery biology since the first World War will prevent a repetition of many of the serious mistakes made during that period, when certain fishery resources were reduced to dangerous levels by uncontrolled exploitation. It is essential, however, that the programs of investigation that are now in progress, and that are providing information essential to proper fishery management, should be continued without interruption through any period of national emergency if our aquatic resources are to be safeguarded.

*North Atlantic fishery investigations.*—Biological fishery investigations in North Atlantic waters are concerned primarily with determining the size of available stocks of fish, measuring fluctuations in abundance of these stocks from year to year, and discovering how large a catch may be made each year without impairing the future productiveness of the stock. For approximately 10 years such a study has been under way for the haddock, which supplies a larger yield than any other New England food fish. It has been demonstrated that in the Georges Bank area, which accounts for the major part of the catch, fluctuations in the abundance of commercial-sized haddock follow regular cycles, which are related to similar cycles in the number of young that survive to commercial size. When years of intensive exploitation of the stock happen to coincide with years of poor survival of the young, a sharp decline in haddock abundance may be expected. Extensive data collected and analyzed by the staff have provided an index of the size of the haddock stocks on Georges Bank for the period from 1914 to 1937. Because of changes in the size and composition of the fleet and the adoption of new gear which in itself increased the effectiveness of fishing operations by at least 29 percent, the catch records alone are no indication of the abundance of haddock, but must be subjected to elaborate statistical analysis before the size of the available stocks may be ascertained.

Mackerel landings on the Atlantic coast in 1939 were considerably smaller than in 1938, although the early months of the 1940 season were marked by a slight upward trend. There has been, moreover, a steady decline in the number of purse-seine vessels engaged in mackerel fishing, with the 1940 fleet the smallest in many years. Investigation of the mackerel fishery has brought to light many significant facts related to the distribution, spawning habits, growth rate, and migrations of the species. While progress has also been made toward determining measures of abundance and predicting changes in the availability and abundance of the mackerel, final solution of these problems awaits offshore investigations from the newly acquired fishery research vessel *Albatross III*.

The various species of groundfish, including the haddock, cod, pollock, rosefish, cusk, hake, and several species of flounders, form the basis of the most important New England fisheries. Fluctuations in the total yield of these fishes have been noticed in past years, but until a biological study of groundfish was begun in 1938 the causes and extent of these fluctuations were unknown. Indices of abundance are now being constructed for each species. When these indices are completed and the requisite knowledge of the life history becomes available for each species, it will be possible to suggest means of maintaining the population at that level which will yield the largest sustained annual catch.

The lobster is of paramount importance to the shore fisheries of the North Atlantic States, since it furnishes a large part of the income of great numbers of small-boat fishermen from Maine to New Jersey. The decline of the lobster catch to approximately one-third of its former level, in spite of vast increases in the amount of gear fished, led to a cooperative investigation by the Bureau of Fisheries and the State of Maine. The primary purposes of this study are to develop improved methods of lobster rearing and to determine the proper legal-size limit. Measurement of lobsters caught commercially along the Maine coast indicates that only about eight percent of the lobster population has an opportunity to spawn, suggesting that present size limits result in both an economic and biological waste. Further research on this problem is in progress.

The past year witnessed increased interest in the restoration of Atlantic salmon. In cooperation with representatives of Maine and other North Atlantic States, a cooperative program designed to restore and maintain salmon runs in favorable New England streams has been prepared. It is hoped that unified support will be accorded this program so that it may be put into effect in the near future.

*Middle and South Atlantic fishery investigations.*—Additional study of the Atlantic coast shad fishery provided confirmation of the opinion expressed a year ago—that the principal cause of depletion is overfishing rather than pollution or obstruction of runs, and that recovery can best be brought about by providing a spawning escapement in such depleted areas as the Chesapeake Bay and the waters of North Carolina which will be substantially equivalent to that which has proved adequate in the Hudson River. Investigations in 1939 also demonstrated the important fact that the moderate fishing rate in the Hudson eventually takes as many shad from each year-class as the more intensive fishery in the Chesapeake, but by spreading the catch over several years allows six times as much spawning from each year-class. Recommendations have been made to the conservation departments of Maryland, Virginia, and North Carolina to the effect that the fishery should be reduced to 60 percent of its present magnitude by restricting the amount of gear licensed.

As a means of securing greater yields and larger profits from each brood of striped bass, regardless of its relative abundance, the Bureau of Fisheries recommended the establishment of a minimum-size limit of 16 inches, measured from the snout to the fork of the tail. This recommendation was adopted by New York during 1939. A slightly higher size limit is in effect in New Jersey. Recommendations for substantial increases in the size limit have been submitted to the fishermen by the Virginia Commission of Fisheries and similar action is expected in Maryland and North Carolina. A survey of Chesapeake Bay and the coastal regions from Virginia to southern New England showed that important striped bass spawning grounds are confined to the Maryland waters of the Chesapeake and Delaware Bays, and the lower Hudson River. According to previous surveys the lower Chesapeake Bay and the sounds and coastal rivers of North Carolina are also productive areas. These observations suggest that fishing for striped bass along the coasts of New Jersey, Long Island, and southern New England is maintained chiefly by migration of fish spawned in other areas. Investigations during the year provided further support for the view that production and survival of striped bass are to a large extent independent of the number of spawners; hence regulatory measures to increase the spawning stock are not of primary importance in the conservation of this species.

*Long Island cooperative investigation.*—Public interest aroused by the cooperative study in which the Bureau of Fisheries participated with the New York Conservation Department, as reported last year, caused the Boards of Supervisors of Suffolk County, and later of Nassau County, Long Island, to contribute funds for a similar cooperative study of local fishery problems. The investigation of the Suffolk County fisheries has been under way throughout the fiscal year 1940; that of Nassau County fisheries since May 20, 1940.

It has been learned that the flounder populations in different regions of Suffolk County are independent, so that measures to improve fishing conditions can be applied directly to individual areas. With the cooperation of pound-net fishermen, methods have been worked out for releasing a large percentage of small sizes of several species of fish taken in nets, thus permitting these young fish to reach a size at which they will be of greater value to commercial fishermen and anglers. The survey has disclosed also that the sport fisheries account for a considerable percentage of the total catch of several important species.

*Shrimp investigations.*—Because of the constantly increasing drain on the supply of shrimp, which is the most valuable fishery product south of Virginia, it has long been considered important to know whether or not there is a reserve supply available beyond the range of the present commercial fishery. This question has now been answered in the negative through the offshore explorations of the vessel *Pelican* in the Gulf of Mexico and along the South Atlantic coast from Fort Pierce, Fla., to Cape Hatteras, N. C. No concentrations of shrimp were found in either area outside the waters now being exploited, a fact which emphasizes the importance of measures recommended for the protection of the supply in inshore waters.

Tagging of shrimp in the Gulf of Mexico during the past year established the fact that here, as on the South Atlantic coast, the shrimp move from the waters of one State to those of another, so that effective conservation of the supply must be accomplished by unified action of the States concerned. Clear evidence of interstate migrations was obtained in waters east of the Mississippi.

Surveys on the South Atlantic coast during the spring months of 1940 revealed a critical condition which threatened the production of a crop for next year's fishery. The number of spawners had been reduced to a dangerously low level through the operation of two factors: The excessive winter fishery in Georgia and Florida which draws upon virtually the entire South Atlantic population of large, migratory shrimp, and the unusually cold winter which killed large numbers of the small shrimp which do not migrate but remain in coastal waters as far north as North Carolina. Because of this drastic reduction of the stock, the cessation of all fishing until July 1 was recommended in order that the remaining shrimp might have an opportunity to spawn.

*North Pacific and Alaska fishery investigations.*—For the second consecutive year the activities of the Columbia River staff have been concentrated upon the problem of salvaging the portion of the salmon run which is barred from its accustomed spawning grounds by the erection of the Grand Coulee Dam. Salmon, steelhead trout, and other fishes bound for the upper Columbia River are being trapped as they pass through the fish ladders at Rock Island Dam, 150 miles downstream, and transferred to tributaries of the Middle Columbia where suitable conditions exist and where it is desired to build up the runs. Because the chinook and blueback salmon have a strong instinct to return to the streams in which they have spent the early months of life, it is expected that such trapping operations will be necessary only throughout one complete cycle of salmon runs. During the period from May 1 to December 9, 1939, 41,722 fish were hauled, of which 36.224 were salmon and steelhead trout. The loss of fish during trapping and hauling was extremely small and observations later in the season revealed successful spawning.

In the Puget Sound area, where the coho salmon are important both from the standpoint of food and recreation, returns of these fish from marking experiments conducted in previous years indicate that releasing fingerlings in the fall produces slightly larger returns and is less expensive than releasing them in midwinter, and is greatly to be preferred to releasing them in the spring of their second year.

Observations on the salmon populations of Bristol Bay, for the purpose of collecting data on which to base a program of management for this valuable resource, were made in 1939 for the second consecutive season. The study of the life histories of the races of salmon populating the lakes and rivers in a watershed of over

35,000 square miles consisted of regular samples of seaward migrant fingerlings taken at five points selected for the purpose. Fingerlings were marked for future identification and released wherever they were available in sufficient numbers, and scale samples, body measurements, weights, and information on sex proportions were obtained from each of the principal rivers during the commercial fishing season. Investigations at sea included experimental fishing and tagging to determine the feeding grounds and migratory routes followed by the adult salmon as they make their way in to the rivers to spawn.

Investigation of the decline in productivity of the Karluk River watershed has revealed that, while the mortality of salmon during the period of life in the sea is remarkably constant, great variations in the percentage of mortality in fresh water are to be expected. These variations are related to changing environmental conditions and to cycles in the fertility of the lake and the abundance of food organisms. A report on the phases of this investigation that are now completed has been prepared for publication.

The existence in the Karluk system of at least two separate populations of the Dolly Varden trout, which prey to some extent on red salmon, has been demonstrated by tagging. Since one of the populations is resident within the lake and the other migrates annually to and from the ocean, control measures, if found necessary, would differ for the two groups.

Improved facilities have now been provided for the study of the pink salmon, which is by far the most abundant species of salmon in Alaska and hence an important source of food. Because of the short life cycle of this species (2 years) it is possible to build up or decimate a population of pink salmon within a short time, hence the need for continued watchfulness. A combination dam and counting weir is now in operation at Little Port Walter, making possible observations that will be used to compute the percentage of mortality in both fresh and salt water. A permanent biological field station has also been established so that biological observations on the survival of the broods may be made throughout the year, permitting more accurate predictions as to the size of the annual runs.

Throughout the year the collection, tabulation, and analysis of the daily catch records of the various types of fishing gear operated by the salmon fishery of Alaska were continued, contributing to an invaluable permanent record of the fishery throughout the Territory. Indices of abundance derived from these data are an important basis for recommendations for changes in the fishing regulations.

The collection of statistical and biological data on the Alaska herring fishery has been continued with a view to safeguarding the supply, which is now utilized principally in the preparation of oils and meals. Although large catches have been made in certain areas, several facts suggest the need of closer supervision of the fishery. Among these are the lack, in the Kodiak area, of any appreciable increments to the stock as a result of spawning in recent years, added to increased fishing intensity and the observed decline in return per unit of gear. Large catches have been made also in Prince William Sound, but here again the yield is being maintained only by increasing the fishing effort. The catch in southeastern Alaska in 1939 was the lowest since the inception of the intensive reduction fishery 15 years ago. This decline is the result of excessive exploitation combined with the failure of several spawning seasons. In an effort to rebuild the stock, fishing in the Cape Ommaney area was prohibited during the 1939 season, and all fishing for reduction purposes was prohibited in southeastern Alaska during 1940.

*Pacific pilchard investigations.*—The object of investigating the pilchard fishery of California, Oregon, and Washington is to determine how large a catch may be made annually without jeopardizing future yields. Recognition of an irreversible decline is made difficult by the existence of natural fluctuations in abundance and variations in the availability of the fish to the vessels. For these reasons evidence on many aspects of the fishery and on the biology of the pilchard populations is necessary and is being collected.

Accurate means of determining the age of pilchards has heretofore been lacking, a fact which has hindered the determination of the contributions made by the various spawning seasons to the commercial stock. Intensive experiments conducted by the staff during the past two years have now disclosed a method of defining and interpreting age marks on the scales of juvenile pilchards through the third year of life, and probably of older fish as well, thus providing an indispensable tool of pilchard research.

Surveys to determine what oceanographic conditions control the survival of young pilchards and to discover the extent of spawning areas and the amount of spawning were carried out with the cooperation of the Scripps Institution of Oceanography during the 1939 and 1940 seasons. During the 1940 survey, pilchard eggs were found over the entire area of 1,800 square miles covered by the survey—from San Diego to about Point Conception—although the maximum spawning seemed to have occurred in a zone parallel to the coast and lying 50 to 100 miles offshore. The location of the spawning area appears to correspond to certain hydrographic features. Data collected will permit computation of the total number of eggs in the area explored and an estimate of the size of the spawning stock. Repeated and extensive surveys of this sort are necessary to determine whether the spawning stock is being maintained at a sufficiently high level to provide adequate replacement for the toll taken by a large and intensive fishery.

While no final conclusions as to the status of the pilchard stock can as yet be drawn, certain facts are evident. During the 1937–38 season, for the first time, the supply failed to equal the demand. During this season also the relatively low catch was accompanied by a decrease in the proportion of large fish in the catch. Without further information these facts do not constitute conclusive evidence of depletion but nevertheless suggest that the pilchard industry has reached the point where further expansion can result only in a rise of production cost.

*Great Lakes fishery investigations.*—Members of the staff continued their active cooperation with State and Federal officials and with sport and commercial fishermen, participating in meetings and conferences in which Great Lakes fishery problems were under consideration and assisting State conservation officials in the drafting of fishery regulations. One of the significant events of the year was the revision of the commercial fishery regulations for the State of Wisconsin waters of Lake Michigan, which, although at present the subject of litigation instituted by certain fishermen, constitutes another important step toward the attainment of uniform regulations for all waters of that State. An event of even more widespread interest and significance was the appointment, on February 29, 1940, of an International Board of Inquiry for the Great Lakes Fisheries. The Board will undertake a study of the fisheries and will submit recommendations as to means of conserving and developing the fishery resources, possibly by international agreement.

Detailed information on fluctuations in the production and abundance of important commercial species and on the intensity of the fisheries of Lake Michigan has now been compiled for a 10-year period. These data have revealed, among other facts, a pronounced decline in the production and abundance of whitefish in Lake Huron in 1938, in which year the abundance index of this fish was only 29 percent of the 1929–34 average. Although recommendations had been made by the Bureau for the control of the deep trap-net fishery for whitefish, no effective measures were adopted until the fishery had sustained damages that possibly are irreparable.

Much of the attention of the staff was given to analyzing data previously collected and to preparing reports on investigations that are now completed. Among these was a report on the fishery resources of the Red Lakes, which constitute one of the principal sources of livelihood for the Red Lake Indians. No positive evidence of a decline in abundance was found. Recommendations were offered for the proper management of these fisheries, based in part upon studies of the growth rates of the various species which indicate the minimum size at which it is desirable to subject these fish to commercial exploitation. Another study which has now yielded useful information is an extensive tagging project carried out in cooperation with a commercial fishing firm of Port Washington, Wis. Of the 2,902 Lake Michigan fish that were tagged and released, 38 percent were recaptured, the results disclosing important information on the extent of migration and the intensity of fishing operations. A study of the age and growth of the yellow perch of Saginaw Bay indicates that the present legal length of 8½ inches possibly is too low, inasmuch as yellow perch of both sexes attain this length just as they are entering on the period of most rapid increase in weight.

*Shellfish investigations.*—Research on oysters was conducted during the year, in accordance with the established policy of the Bureau, (1) to increase technical knowledge of the methods of propagating oysters under various conditions in the coastal waters; (2) to find practical means of improving the quality of marketable oysters; (3) to improve methods of protecting oysters against various pests and parasites; and (4) to determine the effects of pollution and devise means of rendering certain trade wastes harmless to oysters.

Studies of the factors controlling the spawning of oysters have revealed that the old concept of a single critical temperature that induces spawning in oysters is no longer tenable. Depending on the physiological state of ripeness which may be influenced by proper chemical stimulation, the oyster may spawn at various temperatures ranging from 63° to 95° F. These physiological studies have provided a key to a practical method of controlling the spawning of oysters under natural conditions.

In compliance with the request of local oystermen, the Bureau's Milford (Conn.) Station has continued its custom of issuing weekly bulletins on the physiological condition of the oysters in Long Island Sound and the expected time of setting. To this information there have now been added reports on the distribution and abundance of starfish, the principal oyster enemy in this region.

Experiments in North Carolina demonstrated the value and practicability of growing oysters in improved marsh ponds and canals where the depth and velocity of the currents can be controlled. In such areas it is possible to prevent the "smothering" of seed obtained from the early summer spawning by the spat of the September spawning. Even from poor quality seed a growth in volume of over 300 percent was obtained during the first year. By holding seed in special trays it was found possible to cultivate oysters at concentrations equivalent to over 2,000 bushels per acre. These experiments are being continued and developed on a small commercial scale to determine the maximum size and age obtainable by oysters in these waters and the percentage of mortality to be expected according to age and environmental conditions.

Operation of an experimental oyster farm in South Carolina is providing considerable information on the relative value of the various types of bottom for seed-oyster production. On the Gulf coast, where oyster production has been at a low level for a number of years, the staff is cooperating with oystermen and with State conservation departments in formulating programs for the development and maintenance of natural oyster grounds and for the creation of new grounds by planting shells and seed oysters.

Methods of controlling starfish were tested under a variety of field and laboratory conditions by the staff and are being put into practice by many New England and Long Island oyster growers in a vigorous effort to diminish the losses caused by this abundant animal. Oyster drills, which are a serious menace to oysters in the Middle Atlantic States and are now becoming more numerous in Long Island Sound, have been found capable, when only 1 month old, of destroying approximately five oyster spat a day. Because of the heavy depredations of the boring clam, another oyster enemy found in Gulf coast waters, an investigation of the life history of this little-known mollusk has been undertaken at the Pensacola (Fla.) Station.

The study of the effects of pulp-mill pollution on the oysters of the York River, Va., has been completed and a final report on this investigation will be made early in the fiscal year 1941.

*Sponge investigations.*—During the summer of 1939 samples of diseased sponges were received from Florida and subjected to microscopical examination. All were found to be infected with the fungus organism that had been discovered and tentatively identified during the preceding year by one of the Bureau's biologists in surveys of the Bahama Island waters and the Florida Keys. From Key West, where the disease first manifested itself in the United States, it spread to Tarpon Springs, and by the end of December mortality of commercial sponges had proceeded to such a point that fishing was discontinued on bars situated below eight fathoms. At the end of the calendar year 1939 the number of sponges brought to the Tarpon Springs Sponge Exchange had noticeably diminished, causing considerable concern for the future of this resource. During the spring of 1940 there was evidence that the disease had abated and that a large crop of small sponges was in evidence. However, two or three years may be required for a substantial restoration of the commercial-sized supply.

*Aquicultural investigations.*—Studies concerned with the management of fresh-water sport fisheries are conducted along three principal lines. The first is related to the artificial propagation and rearing of game fishes; the second to the problem of controlling the parasites and diseases of fish which frequently curtail the output of hatcheries; and the third to field problems relating to fish management, such as the comparative survival and growth of hatchery and wild trout under natural conditions, the ecological requirements of different species of game and food fishes, and the possibility of increasing fish production in natural waters.

In connection with studies of the artificial propagation and rearing of trout, progress has been made toward developing economical diets without sacrifice of growth. Other experiments have demonstrated that overfeeding of trout brood stock is distinctly detrimental in that it reduces the number of eggs that hatch, while experiments in selective breeding have more than doubled both the rate of growth and the production of eggs.

Studies of the pond culture of largemouth black bass were carried on in Florida with a view to determining the role of fertilizers and forage fish as they affect the production of bass fingerlings per acre. Similar work on a somewhat smaller scale has been conducted in West Virginia. Here, also, field studies of the spawning and survival of smallmouth black bass are being made in selected tributaries of the Potomac River.

The most important result of the studies in fish pathology during the year was the development of a safe, practical, and economical method of controlling the external parasites of fish. Other investigations contributed to an understanding of the causes and prevention of the Western type of gill disease and of the importance of several parasites of trout and bass. In addition to the hatchery studies, losses among wild fish in the field were investigated by the staff. The most important problem of this nature that is currently under study concerns the attacks of fungus organisms which inflicted considerable losses on adult chinook salmon and steelhead trout liberated in the Entiat River in connection with the Columbia River salvage operations.

Fish-management studies on trout waters were carried on at the Pittsford (Vt.) and Leetown (W. Va.) Stations, in the Pisgah Game Preserve in North Carolina, and in Utah, Idaho, and California. One of the surprising results of the "test water" studies conducted in Vermont is the finding that fishing is maintained chiefly by natural reproduction of wild fish, and that stocking with hatchery trout has had little effect. Under conditions obtaining in those waters, stocking with legal-sized fish in the fall has been found to be wasteful, and tests are being made to discover whether stocking with smaller fish will yield better results. In the Pisgah Game Preserve, where the

Forest Service has complete control over all streams, management programs worked out by the Bureau of Fisheries have been in operation. Good results were already apparent in 1939, and during this and the 1940 season it was possible to accommodate more anglers and to permit a longer open season than in previous years. Management studies in the intermountain region have been concerned chiefly with the fisheries problems of Fish Lake, Utah, and of Bear Lake, which is situated almost equally in Utah and Idaho. In California, while experiments on the survival of hatchery trout after planting are still under way, the attention of the staff has been given principally to the problem of devising a plan for salvaging salmon whose migration will be blocked by the Shasta Dam. This dam will be approximately 560 feet high and will cut off all salmon spawning areas above it in the Sacramento, Pit, and McCloud Rivers and their tributaries. The value of these salmon runs has been calculated at $95,000 annually in returns to commercial fishermen. After surveys of potential spawning areas below the dam and of possible sites for trapping the runs for transfer to such areas, a preliminary report embodying recommendations for the salvage operations was issued in June 1940.

*Water quality investigations.*—One of the major activities of the aquatic physiologists during the past year was a study of the effects of various components of larvacides and herbicides on fresh-water fishes and their associated aquatic food organisms. These studies have now provided evidence that in waters treated with even small quantities of arsenicals and several other materials commonly used as mosquito larvacides, there is impairment of the growth and nutrition of fishes.

Application of physiological, biochemical, and metabolic methods to the study of fishes from irrigation waters has demonstrated that the physiological condition and reproductive capacity of such fish is often below par, a condition traceable to the concentrations of mineral salts discovered in many return irrigation waters. The same methods of study applied to fishes from waters polluted with mine wastes revealed that chronic injuries result from much higher dilutions of the wastes than heretofore have been recognized.

During the summer of 1939 intensive studies of stream pollution were made along the Atlantic seaboard and throughout the greater part of western United States, resulting in the collection of much new information on the nature and effects of polluted waters.

Studies of impounded waters were continued at Elephant Butte Reservoir in cooperation with the Reclamation Service and the National Research Council, and at Lake Mead in cooperation with the same agencies and the National Park Service.

*Protection of fish runs from engineering developments.*—The establishment, early in the year, of a section on hydraulics within the Division of Scientific Inquiry provided for the application of biological and engineering skill to fishery problems created by the construction of dams, reservoirs, and diversions for the purposes of power, irrigation, navigation, and flood control.

The work of the Hydraulics Section during the first year of its existence has been devoted to three general phases of fish protection: (1) Supervision of the construction of four large fish screens in Federal irrigation canals and the operation of Federal screens already constructed; (2) consultative services in connection with fish-salvage problems at the Shasta Project on the Sacramento River; and (3) the review of Federal water projects from the standpoint of fish protection. Advice in connection with fishway and screen problems has also been furnished the conservation agencies of several States.

## APPROPRIATIONS

Appropriations for the Bureau for the fiscal year aggregated $2,259,400, as follows:

| | |
|---|---|
| Salaries, Bureau of Fisheries | $183,000 |
| Propagation of food fishes | 949,400 |
| Construction of fish screens | 10,000 |
| Maintenance of vessels | 214,000 |
| Inquiry respecting food fishes | 322,000 |
| Fishery laboratory, Little Port Walter, Alaska | 7,500 |
| Fishery industries | 80,000 |
| Fishery market news service | 76,000 |
| Alaska fisheries service | 268,200 |
| Enforcement of Black Bass and Whaling Treaty Acts | 17,000 |
| Mississippi Wild Life and Fish Refuge | 17,000 |
| Library | 600 |
| Travel expense | 114,700 |
| Total | 2,259,400 |

LIBRARY

U. S. GOVERNMENT PRINTING OFFICE: 1941

UNITED STATES
DEPARTMENT OF THE INTERIOR
HAROLD L. ICKES, Secretary

BUREAU OF FISHERIES
CHARLES E. JACKSON, Acting Commissioner

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Administrative Report No. 39

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# PROGRESS IN BIOLOGICAL INQUIRIES

# 1939

By ELMER HIGGINS

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APPENDIX I TO REPORT OF COMMISSIONER OF FISHERIES
FOR THE FISCAL YEAR 1940

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1940

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## ADMINISTRATIVE REPORT SERIES

Since the beginning of the Administrative Report Series, considerable confusion has arisen concerning the system of numbering the separates composing it. Inasmuch as the Reports of the Divisions vary in order from year to year, many have found their designations as "Appendix No. I, II, III, or IV" very confusing. To relieve this, it has been decided to number them as "Administrative Report No. —." Inasmuch as 20 separates had already been printed in this series before starting the numbers, it was deemed advisable to begin the numbering with Administrative Report No. 21. Of course, numbers cannot be printed on those already off the press, but for the information of those who wish to know what the first 25 were, they are numbered for filing purposes as follows:

No. 1. Report, Commissioner of Fisheries, 1931.
No. 2. Alaska Fishery and Fur-Seal Industries, 1930.
No. 3. Fishery Industries of the United States, 1930.
No. 4. Progress in Biological Inquiries, 1930.
No. 5. Propagation and Distribution of Food Fisheries, 1931.
No. 6. Report, Commissioner of Fisheries, 1932.
No. 7. Alaska Fisheries and Fur-Seal Industries, 1931.
No. 8. Fishery Industries of the United States, 1931.
No. 9. Progress in Biological Inquiries, 1931.
No. 10. Propagation and Distribution of Food Fishes, 1932.
No. 11. Alaska Fishery and Fur-Seal Industries, 1932.
No. 12. Progress in Biological Inquiries, 1932.
No. 13. Fishery Industries of the United States, 1932.
No. 14. Propagation and Distribution of Food Fishes, 1933.
No. 15. Fishery Industries of the United States, 1933.
No. 16. Alaska Fishery and Fur-Seal Industries, 1933.
No. 17. Progress in Biological Inquiries, 1933.
No. 18. Propagation and Distribution of Food Fishes, 1934.
No. 19. Alaska Fishery and Fur-Seal Industries, 1934.
No. 20. Fishery Industries of the United States, 1934.
No. 21. Progress in Biological Inquiries, 1934.
No. 22. Propagation and Distribution of Food Fishes, 1935.
No. 23. Alaska Fishery and Fur-Seal Industries, 1935.
No. 24. Fishery Industries of the United States, 1935.
No. 25. Propagation and Distribution of Food Fishes, 1936.

Note that the last Commissioner's Report was for 1932. Since then its place has been taken by a reprint from the Report of the Secretary of Commerce under the title "Bureau of Fisheries." Inasmuch as it is no longer a Bureau publication, it is not numbered; but it will be supplied to any who request the Report of the Commissioner for any year since 1932.

# PROGRESS IN BIOLOGICAL INQUIRIES, 1939[1]

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By Elmer Higgins, *Chief, Division of Scientific Inquiry*

[With the collaboration of investigators]

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## CONTENTS

| | Page |
|---|---|
| Introduction | 1 |
| Cooperation | 3 |
| Publications | 3 |
| North Atlantic fishery investigations | 6 |
| Mackerel | 8 |
| Haddock | 11 |
| Flounder | 15 |
| Analysis of groundfish abundance | 17 |
| Lobster | 21 |
| Middle and South Atlantic fishery investigations | 23 |
| Shore fishes | 24 |
| Anadromous fishes | 24 |
| Fisheries of South Carolina | 26 |
| Suffolk County cooperative investigation | 27 |
| Shrimp investigations | 29 |
| Offshore operations | 30 |
| Migration studies | 31 |
| North Pacific and Alaska fishery investigations | 33 |
| Columbia River | 33 |
| Coho salmon | 36 |
| Survey of Alaskan lakes | 37 |
| Bristol Bay salmon fisheries | 38 |
| Karluk River red salmon | 41 |
| Dolly Varden trout | 43 |
| Pink salmon | 44 |
| Alaska salmon statistics | 46 |
| Herring | 47 |
| Pacific pilchard investigations | 49 |
| Studies of abundance | 51 |
| Age and growth | 51 |
| Sampling | 52 |
| Early life history | 53 |
| Condition of the resource | 54 |
| Great Lakes fishery investigations | 55 |
| Fishery statistics | 57 |
| Red Lakes investigation | 57 |
| Migration of Lake Michigan fishes | 59 |
| Age and growth studies | 60 |
| Cooperative investigations of Wisconsin lakes | 61 |
| Shellfish investigations | 63 |
| Oyster-culture studies | 63 |
| Respiration of the oyster | 69 |
| Oyster pests and parasites | 70 |
| Effect of pulp-mill pollution on oysters | 72 |
| Sponge-fishery investigations | 73 |

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[1] Administrative Report No. 39, Appendix I to Report of the U. S. Commissioner of Fisheries for 1940. Approved for publication May 13, 1940.

Page
Aquicultural investigations 74
Trout 75
Warm-water fishes 76
Field studies 77
California trout and salmon investigations 80
Parasites and diseases of fish 81
Nutrition studies at the Cortland Hatchery 82
Investigations in interior waters 85
Hydraulic section 88
Ichthyological investigations 89
Independent activities of the biological laboratories 90
Woods Hole, Mass 90
Beaufort, N. C 90
Appropriations 95

# INTRODUCTION

Progress in biological inquiries during 1939 recounts numerous advances and extensions of scientific knowledge of the Nation's aquatic resources. From the research of the Division of Scientific Inquiry there is emerging a philosophy of fishery management that is finding direct application in State laws for the protection and development of the commercial fisheries and in the more active measures adopted for the rehabilitation and maintenance of the recreational fisheries.

The growth and expansion of fishery research throughout the almost 70 years that have elapsed since the establishment of the old U. S. Fish Commission is an interesting study. The early scientific investigations were either casual surveys or attempts to discover and to catalogue the aquatic resources. The strictly scientific surveys of the *Albatross*, the *Fish Hawk*, and the *Grampus* that bridged the end of the last and the beginning of the present century were paralleled by or followed by special investigations of specific phases of our inland water resources. From those studies there resulted a basic fund of oceanographic, ichthyological, and general zoological information. That basic research program has never ceased, for the spirit of discovery still persists throughout all of the Bureau's scientific endeavors.

The purely systematic and distributional studies of fishes and invertebrates of commercial importance did not long remain ends in themselves. It was not only necessary to know what we had but also how each item behaved in relation to its environment. Thus life-history and ecological studies of the most important fishes, molluscs and crustaceans were conducted with the object of obtaining information that would suggest means of insuring a continuation of the supply at a safe level of abundance. Statistical methods of analysis were adopted to interpret the large quantities of data that were accumulated. Fundamental concepts of fishery management were developed and applied and biological investigation thus become an indepensable tool of conservation.

The specific aim of the research concerned with both marine and fresh-water fisheries is an analysis of the fluctuations in natural abundance and production in an attempt to discover methods of balancing commercial yields against reproductive activities. In other words, the continuation of any fishery resource demands that an adequate breeding population always remain and that commercial production should remove only the surplus, or "annual crop."

Unfortunately, the depletion of many commercial fishery resources has been allowed to progress to a critical point before the financial support of investigation to discover means of protection was provided. Any attempts at rehabilitation based on scientific findings, necessarily are slow, especially since the fishing industry must be maintained at as high a level of production as is consistent with the preservation and recovery of the stocks. The research programs concerned with the major commercial fisheries have been in progress for a sufficient time to enable recommendations for revised regulations and methods of management to be formulated.

Because the Bureau serves only as an investigative and advisory agency in most of the commercial-fishing areas, the practical application of recommendations is difficult and often tardy. More often than not, the general public has not been informed of the condition of the resources and the need for regulations. The lack of public appreciation permits the industry to oppose, unchallenged, constructive recommendations for legislation which they do not favor. The differences in the laws of States that border on the same waters are often a deterrent to the adoption of adequate conservation measures, for when the question of uniform laws arises the fishermen often clamor for the adoption of the regulations of that State which has the least stringent code. The problem of divided control seems much nearer a permanent solution at the present time than ever before. The success of international commissions, vested with full regulatory powers, in bringing about the recovery of depleted marine resources that are exploited in international waters is becoming well known. The recent authorization of interstate compacts by Congress for the purposes of formulating and enforcing conservation measures promises to provide a suitable vehicle for adequate control of fishery resources within the United States.

The invasion by recreational fishermen of marine and fresh-water areas formerly exploited principally by commercial fishermen has created additional problems for the fishery biologist. Angling has been conducted in commercial-fishing areas for a long time and the increase in intensity has perhaps been more gradual than the publicizing of the enterprise during the last several years would imply. Reliable estimates of the angling for certain commercially exploited species in areas of the Atlantic coast, the Great Lakes, and the Pacific coast indicate that the total annual catch of recreational fishermen may equal, at times, the catch of commercial fishermen. The magnitude of sport fishing conducted in some areas in competition with commercial fishing will necessitate the development of statistical procedure more complete than exists at present to measure the annual catches of both methods of fishing. An extension of the scope of research activities to consider the effect of angling on the natural abundance of heavily exploited species also will be imperative.

The cooperation of many States in the collection of reliable commercial fishery statistics is becoming greater each year. Records that enable the fishery biologist to study fluctuations in abundance in the major fishing areas are essential to the development of management procedures. Periods of unusual availability or of low levels of abundance can be anticipated if continuous and uniform statistical records that lend themselves to abundance analyses are available. A nation-wide and uniform State system for the collection of daily records of individual fishing enterprise for all commercial-fishing areas cannot be urged too strongly.

One of the important functions of the Division of Scientific Inquiry during recent years has consisted of cooperation with the Division of Fish Culture in projects related to artificial propagation of food and game fishes. From the "veterinary service" originally provided for hatcheries there has developed, in different parts of the country, a diversified cooperative program of assistance. Studies of hatchery disinfectants, methods of disease control, methods of fertilization, selective breeding, hatching, rearing, and planting, as well as feeding experiments and nutrition studies have been undertaken. The popularity of the processed publication, The Progressive Fish-Culturist, sponsored and edited by the Division, has continued to grow and it has become the principal means of disseminating practical and scientific information related to fish culture and fish management in fresh waters.

The studies of interior waters in relation to their value as angling resources constitute yet another phase of the Division's work. Unlike the commercial fishery investigations which were faced with critical conditions at the outset, the opportunity is afforded to assess many of the angling resources while they are in a healthy state. The accumulation of information related to the management of angling resources, stream improvement, and the formulation of stocking policies has progressed as rapidly as the limited funds and investigative personnel will permit. The related studies of the effects of pollution of all kinds have been advanced significantly both through controlled laboratory experimentation and ever-widening field investigations. A comprehensive study of the effects of larvicides and insecticides on fish populations has yielded important conclusions.

## COOPERATION

The scope of the investigational activities of the Bureau has become so broad and diversified, as indicated by the preceding general discussion and the detailed reports which follow, that neither the appropriations nor the staff are adequate to carry on the work unaided. The cordial relations with many colleges and universities and their generous provision of laboratory space, equipment, and other facilities have enhanced the work of the Division for many years.

The material cooperation of a number of States, various State agencies, and of many establishments of the Federal Government has continued in greater measure than ever before. The U. S. Forest Service, the Bureau of Reclamation, the War Department, the Coast Guard, and the Tennessee Valley Authority have been concerned in cooperative undertakings during the past year. The Council of State Governments has continued to provide active assistance to the Bureau and to various States in the promotion of interstate and international cooperation in the development of means and measures for the preservation of the Atlantic coast and Great Lakes fisheries. The North American Council on Fishery Investigations, composed of representatives of the United States, Canada, Newfoundland, and France, held no meetings during the year because of the war in Europe. The organization remains active, however, and regular meetings will be resumed as soon as conditions permit.

## PUBLICATIONS

Although substantial progress has been made in all of the Division's many fields of investigation, and a number of manuscripts were completed during the year, the available funds for printing were so limited that the actual dissemination of printed information was extremely meagre. There are on file a large number of manuscripts which represent an investment in time and materials many times as great as the cost of publication. The reports of the investigations that have been completed are sorely needed as scientific references and as sources of information for management and legislation. The practical value of many of these unpublished reports will diminish gradually through the protracted delay in publication, but, fortunately, their scientific worth will suffer little. The very scanty number of scientific publications by the Bureau during recent years does not reflect the constantly expanding responsibilities and the continuous improvement in the calibre of the investigative personnel.

The following publications appeared in the Bureau's series during 1939:

BELL, FRANK T., and ELMER HIGGINS.
  A plan for the development of the Hawaiian fisheries. Investigational Report No. 42, 25 pp., 3 figs.
GALTSOFF, PAUL S., and VICTOR L. LOOSANOFF.
  Natural history and method of controlling the starfish (*Asterias forbesi*, Desor). Bulletin, U. S. Bureau of Fisheries, vol. XLIX, No. 31, pp. 75–132, 32 figs.
HIGGINS, ELMER.
  Progress in biological inquiries, 1938. Administrative Report No. 35, 81 pp.
PEARSON, JOHN C.
  The early life histories of some American Penaeidae, chiefly the commercial shrimp, *Penaeus setiferus* (Linn.). Bulletin, U. S. Bureau of Fisheries, vol. XLIX, No. 30, pp. 1–73, 67 figs.

The following papers were published by members of the staff of the Division of Scientific Inquiry, during the year 1939, in journals of other organizations:

CRAIG, J. A.
  Critique on Fisheries. The Pacific Northwest: A selected bibliography. The Northwest Regional Planning Council. 1939. Portland, Oreg.
DAVIDSON, FREDERICK A.
  The conservation of the Alaska salmon fisheries. The Military Engineer, vol. 31, No. 176, 1939, pp. 109–111, 3 figs.
  Why it's important to protect our salmon. Alaska Life, vol. 2, No. 1, February 1939, pp. 8–9, 18; 1 fig., map.
DAVIDSON, FREDERICK A., and A. E. VAUGHAN.
  Cyclic changes in the time of the southeast Alaska pink salmon runs. Pacific Fisherman, Feb. 1939, pp. 22–24 (pt. 1); Mar. 1939, pp. 40–42 (pt. 2); Apr. 1939, p. 39 (pt. 3).
DEASON, HILARY J.
  Report of the Division of Commercial Fishing. Transactions, American Fisheries Society, vol. 68, 1938 (1939), pp. 27–30.
  The distribution of cottid fishes in Lake Michigan. Papers, Michigan Academy of Science, Arts and Letters, vol. XXIV, pt. II, 1938 (1939), pp. 105–115.
FIRTH, FRANK E.
  A record size (480 mm.) John dory (*Zenopsis ocellatus*) with notes on its distribution in our North and Middle Atlantic waters. Zoologica, vol. XXIV (pt. II), Oct. 1939, pp. 383–384, 1 fig.
FISH, FREDERIC F.
  Notes on *Myxobolus inornatus* n. sp., a myxosporidian, parasitic in the black bass (*Huro floidana* Le Sueur). Transactions, American Fisheries Society, vol. 68, 1938 (1939), pp. 173–177.
  Simplified methods for the prolonged treatment of fish diseases. Transactions, American Fisheries Sociey, vol. 68, 1938 (1939), pp. 178–187.

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GALTSOFF, PAUL S., H. H. BROWN, C. L. SMITH, and F. G. SMITH.
Sponge mortality in the Bahamas. Nature, vol. 143, 1939, pp. 807–808.

GINSBURG, ISAAC.
The measure of population divergence and multiplicity of characters. Journal, Washington Academy of Sciences, vol. 29, 1939, pp. 317–330.
Two new gobioid fishes collected on the Presidential cruise of 1938. Smithsonian Miscellaneous Collections, vol. 98, No. 14, 5 pp., 2 figs.

HILDEBRAND, SAMUEL F.
An annotated list of the fishes collected on the several expeditions to Greenland, the Fox Bay region, and the coast of Labrador by Captain R. A. Bartlett, from 1925 to 1935. Meddelelser om Grønland, Bd. 125, Nr. 1, 1939, 12 S.
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LOBELL, MILTON J.
Report on certain fishes: winter flounder (*Pseudopleuronectes americanus*). In: A Biological Survey of the Salt Waters of Long Island. 1938. Pt. I. Supplement to Twenty-eighth Annual Report, New York Conservation Department, 1939, pp. 63–96.

NEEDHAM, PAUL R.
Migratory fishes and dam construction in West coast waters. Transactions, Fourth North American Wildlife Conference, 1939, pp. 300–304.
Natural propagation versus artificial propagation in relation to angling. Transactions, Fourth North American Wildlife Conference, 1939, pp. 326–331.

NEEDHAM, PAUL R., and H. J. RAYNER.
The experimental stream, a method for study of trout planting problems. Copeia, 1939, No. 1, March, pp. 31–38.

NESBIT, ROBERT A.
Report on certain fishes: weakfish (*Cynoscion regalis*). In: A Biological Survey of the Salt Waters of Long Island, 1938. Pt. I. Supplement to Twenty-eighth Annual Report, New York Conservation Department, 1939, pp. 97–106.

NEVILLE, WILLIAM C.
Description of Long Island. In: A Biological Survey of the Salt Waters of Long Island, 1938. Pt. I. Supplement to Twenty-eighth Annual Report, New York Conservation Department, 1939, pp. 11–14.

NEVILLE, WILLIAM C., CHARLES L. DICKINSON, and JAMES R. WESTMAN.
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NICHOLS, J. T., and FRANK E. FIRTH.
Rare fishes off the Atlantic coast including a new grammicolepid. Proceedings, Biological Society of Washington, vol. 52, June 5, 1939, pp. 85–88.

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SUMNER, FRANCIS H., and OSGOOD R. SMITH.
A biological study of the effect of mining debris dams and hydraulic mining on fish life in the Yuba and American Rivers in California. Report submitted to U. S. District Engineer's Office, Sacramento, Calif., May 1, 1939, 51 pp., 14 figs., 3 maps. [Mimeographed.]

SURBER, EUGENE W.
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VAN OOSTEN, JOHN.

A common concern—Great Lakes fisheries for anglers and fishers. Michigan Game Trails, vol. 1, No. 5, 1939, p. 1.

Battle rages over closing Potagannissing Bay to commercial fishermen. Michigan Game Trails, vol. 1, No. 3, 1939, pp. 19–20.

Can the Great Lakes fisheries be saved? American Wildlife, vol. 28, No. 3, 1939, pp. 129–135.

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The age, growth, sexual maturity, and sex ratio of the common whitefish, *Coregonus clupeaformis* (Mitchill), of Lake Huron. Papers, Michigan Academy of Science, Arts, and Letters, vol. XXIV, pt. II, 1938 (1939), pp. 195–221.

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The age, growth, and feeding habits of the whitefish, *Coregonus clupeaformis* (Mitchill), of Lake Champlain. Transactions, American Fisheries Society, vol. 68, 1938 (1939), pp. 152–162.

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Report to the Michigan State Senate on the fisheries of Potagannissing Bay, Mich. Michigan Department of Conservation, Lansing. 82 pp.

### MULTILITHED PUBLICATIONS

HERRINGTON, WILLIAM C., H. M. BEARSE, and FRANK E. FIRTH.

Observations on the life history, occurrence, and distribution of the redfish parasite *Sphyrion lumpi*. Special Scientific Report No. 5, 12 pp., 6 figs.

U. S. BUREAU OF FISHERIES.

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Progress reports of the investigations conducted by the various sections, prepared in the main by the section heads, are presented in the following pages:

## NORTH ATLANTIC FISHERY INVESTIGATIONS

WILLIAM C. HERRINGTON, *in charge*

The situation of the offshore fisheries in the North Atlantic region was somewhat better in 1939, on the whole, than during 1938. The total catch, as shown by landings at Boston, Gloucester, and Portland, was nearly as great as in the previous year in spite of labor difficulties which caused temporary tie-ups. The catch reached 389,000,000 pounds, about 3 percent less than in 1938, but, due to higher average prices, it brought the fisherman more than $9,300,000, an increase of nearly 7 percent over the 1938 value. This offshore catch landed at the three principal New England ports represents more than half of the total New England poundage of fish and shellfish. In 1937 it amounted to about 60 percent of the total weight and 50 percent of the total value of the New England catch.

The shipbuilding boom of the past few years, which included the construction of a large number of new otter trawlers of the "super trawler" class, did not continue in 1939. In contrast, there was a shrinkage in the fleet of large otter trawlers, since many of the old steamers were disposed of. By the end of the year only 6 steamers remained in operation out of a one-time total of around 40 boats. The decommissioning of old boats balanced the new construction approximately, so that total fishing intensity due to the large boats was about the same in 1939 as in the previous year.

The great fisheries of the North Atlantic have been subject to tremendous fluctuations in yield since the early days of the fishing industry, yet neither the extent of these changes nor their causes and probable duration have been known. An understanding of these factors, based on a comprehensive study of the biology and catch records of the important species, is necessary to maintain the fisheries at a high productive level or to suggest corrective measures in instances of overexploitation. Studies of the mackerel and haddock offshore fisheries have been under way for several years, and recently have been started on flounders. A much needed general study of the fluctuations in abundance of other groundfish was begun in 1938. No biological work has been possible recently on the important fisheries for cod, redfish, pollock, and swordfish.

The biggest handicap to the understanding of present trends in the extensive inshore fisheries of the North Atlantic coast is the lack of adequate catch statistics to provide a measure of changes in abundance. The most important problems involve the improvement or maintenance of the fisheries for flounders, lobster, haddock, cod, and salmon, which form the chief means of support for the coastal communities on long sections of the New England coast.

Cooperation with various State organizations has increased and has proved very satisfactory and productive. In addition to assisting in the inauguration of a general State system for collecting current catch records, the staff cooperated in various other projects. The most significant undertaking was the lobster investigation. The lobster fishery is an extremely important resource from Maine to New Jersey, and is second in value only to the haddock fishery in the region as a whole. In spite of the fact that it has been generally admitted for some time that the lobster fishery was in a serious condition, and has been subjected to regulation for many years, little biological work has been done recently to develop a sound basis for intelligent management. In order to obtain much needed information concerning improved rearing technique and the value of various regulations, the Maine Department of Sea and Shore Fisheries turned over to the Bureau a fund to cover the salary of a biologist to work in this field. The Bureau has provided the other expenses of the investigation.

Working in cooperation with several State officials, an annual lobster conference has been organized to bring together representatives of the industry and conservation departments of the interested States for a discussion of mutual problems and development of progressive and uniform conservation regulations. Meetings were held in February and July, 1939.

The past year witnessed increased interest in the restoration of Atlantic salmon. At the request of the National Wildlife Federation, W. C. Herrington and Dr. G. A. Rounsefell, in cooperation with Mr. George H. Stobie, Maine Commissioner of Inland Fisheries, and repesentatives of other North Atlantic States, prepared a long-period, cooperative program designed to restore and maintain salmon runs in the most favorable New England streams. It is hoped that the concentration of support behind one sound basic program will make it possible to get something definite started by the States and the Bureau in the near future.

During the past year an extra effort was made by the North Atlantic staff to develop a more widespread knowledge of and interest in the marine fisheries problems of the region. Working in cooperation with Dr. Daniel Merriman, of Yale University, a marine section was added to the annual meeting of the New England Game Conference.

After 8 years with no sea-going equipment, the Division finally obtained a 41-foot hull by transfer at Boothbay Harbor from the Division of Fish Culture. With the assistance of Supt. Thomas Dorr and his crew, the boat has been renovated, a cabin and engine room added, and an engine installed. She was christened *Skimmer*, and will be used in inshore waters principally for flounder work. However, the major contribution to our fleet came through a gift of the 152-foot steam trawler *Harvard* from the General Seafoods Corporation. This boat was built in 1926, and although the hull was in good condition, had been tied up for several months due to the relatively high cost of operating steam-powered trawlers, compared to Diesel-powered. A grant of $125,000 has been obtained from the P. W. A. and this boat, which has been named *Albatross III*, will be renovated during 1940.

Commissioning of the *Albatross III* will make it possible to undertake annual surveys of the fishing grounds from Cape Cod to the Newfoundland Banks. These surveys will provide information on the abundance and distribution of the various species of marketable fish and will enable us to assess the strength of year classes 1 and 2 years before they enter the commercial fishery. Numerous problems connected with the mackerel investigation, tagging, and gear experiments also can be attacked.

Although good progress is being made in the various investigations, in many cases the work has been seriously limited by the lack of sufficient technical and clerical assistance to collect and analyze the data required for certain phases of the work. W. P. A. projects Nos. 365–14–3–4 and 702–3–2, which expired in the spring of 1939, and No. 765–14–3–20, which was begun on July 5, 1939, have made possible the continuation of the compilation and charting of statistics bearing on the development of the New England fisheries and the analysis of the records of the haddock fishery for early years, as well as a study of the early groundfish fishery.

The headquarters of the North Atlantic Fishery Investigations has remained in Cambridge and Boston, Mass. Harvard University has generously provided the staff with space and facilities in its biological laboratories. The cooperation of the Woods Hole Oceanographic Institution is gratefully acknowledged, as is the personal advice and interest of Prof. Henry B. Bigelow. The assistance and cooperation of fishermen and dealers in providing the use of their records, and in other ways, is also acknowledged with pleasure.

## MACKEREL

Catch records indicate that mackeral landings on the Atlantic coast in 1939 were considerably less than in 1938. This decrease is shown by receipts of mackerel at the three principal New England ports, Boston, Gloucester, and Portland; 20,887,000 pounds in 1938 compared to 12,319,000 pounds in 1939. In 1935, the last year of high mackerel landings, 45 percent of the total Atlantic coast mackerel catch was landed at these ports. To the fishermen, this drop in landings was accompanied not by a price increase, but by a slight decrease; the average being 2.8 cents per pound in 1938 and 2.6 cents per pound in 1939.

Conditions in the mackerel fishery have not been encouraging to owners of New England vessels which annually account for more than one-half of the total mackerel production. The last 5 years have witnessed a steady decline in the number of purse seiners entering the mackerel fleet: in 1935, there were 99, but only 49 in 1939. Most of the 50 vessels lost to the mackerel fishery have taken up groundfish dragging. Dependable profits to fishermen in a well-established rosefish fishery, especially, have offered relief from the uncertainties of the mackerel supply and discouraging financial returns. Such uncertainties are not new to the mackerel fishery. Violent fluctuations in the catch from one year to the next have bothered the trade and the fishermen for more than a century.

The mackerel investigation begun in 1926 had for its purpose the discovery of causes for the great differences in annual yield, with a view toward turning its findings to economic advantage. Several lines of investigation were inaugurated for solution of the problems. These were: (1) The collection of catch records, to provide a means of comparing past with present production of mackerel. (2) The determination of a measure of abundance not affected by changes in the size of the fleet or the amount of gear fished. (3) The study of such salient features of mackerel biology as might have a bearing upon the problem: geographical distribution, spawning habits, rate of growth, life span, migrations, etc. (4) A study of conditions in the sea to determine what environmental factors influenced appreciably the biological features mentioned above.

Catch records assembled from many sources revealed an 80 to 100 million-pound production level, roughly speaking, from 1804 to 1885. This was the "hey-dey" of the fishery, when annual production occasionally exceeded 100,000,000 pounds. The last such peak, in 1884, was followed by a drop to about 25,000,000 pounds in 1886. Since that time mackerel production has averaged approximately 30,000,000 pounds a year. The last good year was 1935, when total Atlantic coast landings approximated 80,000,000 pounds. In 1937, the total production was about 25,000,000 pounds.

Mackerel first appear off Virginia in the spring, and are found progressively northward to the Gulf of St. Lawrence as summer advances. The offshore fishery rarely extends more than 100 miles from shore, while the activity of the fleet is confined largely to a strip of water averaging less than 50 miles from the coast. With the approach of cold weather, mackerel apparently leave the Gulf of St. Lawrence and head southward. Until 3 years ago the fishery had ceased off southern New England by the end of December. During the past 3 years, however, a few purse seiners have continued operations into January.

Observations have demonstrated that spawning in the southern part of the range takes place between April and August. Due to rapid summer growth, mackerel attain minimum marketable size their first fall: about 8 or 9 inches in length. As a rule, the maximum size attained is about 22 inches in length and about 4 pounds in weight, during a life span of approximately 12 years.

Although no direct measure of mackerel abundance has been found, their availablity to the purse-seine fishery has been taken as roughly indicative of abundance under actual conditions. Of course, this fails to measure adequately the availability except where the fleet is fishing. The strictly shoreward dispersal of the species, and its distribution on distant banks, has not been measured.

During the course of the investigation it was found that the make-up of the commercial fishery in any year was predominantly mackerel of one or two year classes. Sometimes a single year class has been important to the catch for as long as 5 years. In other seasons the year class of most importance has been of a transitory nature, appearing for but one year and then dropping out of the catch quite rapidly.

Observations indicated two principal factors that control mackerel abundance—the recruitment of new year classes to the fishery, and the losses due to mortality. Having obtained a measure of these factors, a series of fairly successful catch forecasts was begun in 1931. In 1937, however, the catch by the vessel fishery fell about 40 percent below the prediction. Since this circumstance indicated the operation of unknown factors, forecasts have been discontinued pending further research to discover them.

*Progress during 1939.*—The mackerel investigation in 1939 was under the direction of John R. Webster, who was assisted by Frank E. Firth. Analysis of the commercial landings showed three size groups in the mackerel populations during 1938—the year class of 1937, the year class of 1936, and a mixed group of year classes from 1934 to 1930. No one group dominated the catch for an entire year. All groups exhibited marked increases in availability compared to the previous year which averaged about 500 percent for the 1937 and 1936 year classes, and more than 100 percent for the mixed group of older fish.

The causes of such an increase in availability must be found in environmental conditions. To be caught by purse seiners, mackerel must be sighted while they school at the surface. Records of surface-water temperatures at lightships along the New England coast during the summer of 1937 were above normal, sometimes by as much as 7° F. It was at this time that the mackerel catch fell off the most. Temperatures during the summer of 1938 were near or slightly below normal.

The spring purse-seine fishery shifts its activity from the Middle Atlantic area to the Gulf of Maine as rapidly as mackerel become commercially available there. The question arises as to whether abundance of the shore run of mackerel keeps pace with that of off-shore populations. Progress in solving this problem has been made through the assembling of trap-catch records for 1937 and 1938 covering the coast from Virginia to Massachusetts. The records indicate that considerable numbers of mackerel persisted in the Middle Atlantic region for at least 2 months after seiners in the spring fishery quit the region.

Field work in 1939, conducted principally by Mr. Firth, was confined largely to securing measurements, scale samples, and interviews with boat captains who landed catches. Data were secured in New Jersey and New York in April and May, and at the Boston Fish Pier during the remainder of the year. Sufficient data concerning 675 mackerel trips were secured by interview to provide representative information concerning fleet activity. A total of 49,000 mackerel measurements will form a basis for population studies, and 450 scale samples will enable age determinations to be made.

Considerable difficulty has been experienced in developing a suitable tag and tagging technique, for mackerel in order to study the migration problem. Several kinds of tags have been tried, but they have yielded discouragingly low percentages of returns. Experiments conducted by Mr. Webster at Woods Hole in August indicated, beyond reasonable doubt, that the chief problem of tagging is one of handling mackerel properly.

### HADDOCK

The North Atlantic haddock fishery of the United States extends from the coast of southern New England to the western portion of the Grand Banks, and in the past 13 years has produced between 150 and 250 million pounds annually. The peak years came between 1928 and 1930, but they were followed by a rapid decline to approximately 150 million pounds in 1932. Since 1932 the catch never has approached the 1928–30 level. The fishery in 1939 was comparatively successful from the point of view of the industry. The total catch of 135 million pounds landed at Boston, Gloucester, and Portland (which accounts for 80 to 90 percent of the United States total) was slightly higher than in 1938 in spite of labor troubles which tied up many of the large trawlers for several weeks. Prices averaged about 11 percent above 1938, so that the total value of the above catch reached $3,693,000. The increase in the price of scrod was particularly noticeable, for after a poor start during the period January–March the price rose above that of the previous year and maintained the advantage for the balance of the season. The average increase for the year was 35 percent.

Two-thirds of the 1939 catch came from area XXII So. (Georges Bank and South Channel) and present experience indicates that on the average this area will continue to supply the bulk of the New England haddock catch in the predictable future. Prior to 1935, between 70 and 90 percent of the catch ordinarily came from this area. However, the appearance of the tremendously abundant 1929 year class on the Nova Scotian Banks caused a shift of fishing activities which reduced the Georges catch in 1934 to 30 percent, and in 1935 to 40 percent of the total. With the exhaustion of this great year class, there has been a progressive shift of fishing activity back to Georges Bank. As no year class comparable to that of 1929 has been observed on the Nova Scotian Banks in subsequent years, while several have appeared on Georges Bank, it would appear that the latter bank is more regularly productive than the former, and, except for limited intervals, will continue to be our principal source of supply. The trend back to Georges Bank in 1939 was stimulated by the campaign for an improvement in the quality of fish and has emphasized the importance of short trips. This makes fishing on Georges Bank particularly advantageous, since most of the bank is less than 1 day's run from Boston.

The Grand Bank fishery still seems to be beyond the practical range of our fleet. Several scouting trips were made to this area during 1939, but the distance is so great that the catches ordinarily do not justify the extra time and fuel consumption.

The unfortunate trend toward concentration of the fishery on small haddock has continued, and in recent years the fleet has taken an increasing quantity of scrod haddock. This size category made up 25 percent of the total catch in 1937, 32 percent in 1938, and 38 percent in 1939. On Georges Bank alone, the proportion ran even higher—43 percent in 1939. The increased capture of scrod is definitely prejudical to the future of the haddock fishery, since haddock of the small sizes affected are growing rapidly, and another year on the bank would increase materially the poundage in the sea available to the fisherman. The increased concentration on scrod will reduce even further the supply of haddock available.

It was demonstrated early in the present investigation that although the great decline in catch immediately following 1930 was partly due to economic factors, the principal cause was the scarcity of haddock as compared to earlier years. The major problems to be solved are the detection of the causes of the scarcity, whether due to natural conditions or to the commercial fishery, and the determination of how these causes could be controlled so that the fishery might be restored and maintained at the most productive level.

In attacking these problems, a consistent program of investigation has been pursued which stresses the following points: (1) The collection and compilation of present and past records to show the total quantity of haddock taken by the commercial fishery from each of the principal fishing grounds. (2) The development and application of an index of abundance to show accurately the changes in the stocks of fish, rather than changes in gear or fishing methods. (3) A determination of the relative success of reproduction from year to year and its relationship to measurable features of the natural environment. (4) A determination of the interdependence of haddock stocks through study of the passive movements of eggs and larvae and the migration of bottom stages. (5) A study of features of the biology of the species, such as growth rates, mortality rates, and distribution, that are needed to interpret the various population data. (6) An analysis of modifications in fishing procedure to determine the most practical and effective methods for obtaining an optimum yield. This involves experiments with savings gear, the charting of nursery grounds, and related projects.

Extensive records of fishing activities of the otter-trawl fleet from 1914 to the present were accumulated from various public and private sources. After considerable analysis, a method of calculating the relative abundance from year to year was developed which gave consistent results in spite of changes in fishing intensity from month to month and from year to year. By use of this method an index of abundance, or availability, was nearly completed for 1914–37. This index demonstrates that in the Georges Bank region regular cycles in abundance of commercial-sized haddock occurred in the early years of the fishery before the fishing intensity had become severe. These cycles of 7 to 9 years in length were caused by similar cycles in the success or failure of the survival of young to commercial size. The cycles in the survival of young tentatively appear to be correlated with the magnitude of the adult stock, with poor survival in years of extremely high as well as of low abundance of adults, and good survival in years of intermediate abundance. There are other apparently noncyclic variations from year to year which appear to be due to features of the physical environment.

The precipitous drop in haddock abundance during the years 1929 to 1931 was due to the coincidence of a period of greatly increased fishing intensity and that portion of the natural cycle having a minimum replacement of young. Consequently, with a heavy drain from the commercial fishery and negligible replacements of young fish, the abundance of marketable haddock declined at a rapid rate. Following the low level reached in 1931 the abundance has recovered to some extent, but has failed to build up to levels comparable to the 1926–28 period since the commercial fishery has been so intensive that no considerable accumulation of market-sized haddock was possible.

Information concerning the haddock populations off the Nova Scotian coast is much less complete, for our fleet fished this area only sporadically until 1933–34, and practically no fishing was done in the area during the years of high abundance on Georges Bank. Therefore, the continuous measure of abundance available for Georges Bank is not available for the Nova Scotian coast.

A large amount of subsidiary biological information, discussed in previous annual reports, has been obtained to assist in the explanation and understanding of the abundance cycles.

*Progress during 1939.*—The investigation was continued under the direction of Mr. Herrington with the part-time assistance of H. M. Bearse and M. S. Moses. Dr. Rounsefell continued the Maine tagging experiment begun in 1938. Field work was limited mainly to the collection of the basic data required for determining the age, number, and size composition of the 1939 catch, since analysis of abundance now is included in the groundfish studies. During the course of the year Mr. Bearse obtained length measurements of nearly 50,000 haddock and collected 3,500 haddock scale samples.

Laboratory work was concentrated on the completion of the haddock abundance index from 1914 to 1937 and the compilation of a record of the total monthly haddock catch from the Georges Bank and Nova Scotian areas for the same period. Records of total monthly haddock catches were obtained from Bureau records for Boston, Gloucester, and Portland, and from records of fishing companies for New York and Groton. These records account for nearly the entire offshore haddock catch. The compilations are required to show the total fishing strain and for use in evaluating the effect of increased gear competition.

Completion of the primary stage of computing the abundance index required special analysis to compensate for certain gaps in our data for 1914 to 1916. Portland landings, shown only as total haddock, were divided into large and scrod on the basis of hailed weights. Statistical analysis showed that this method was consistently accurate. The running time between port and fishing grounds, which is required for our calculation of fishing effort, was obtained from the length of trip since data for 1917 to 1920 showed that there was a high degree of correlation between these two components of a trip.

In the more complete records and refined analysis for late years, a number of minor difficulties were solved. The validity of variations in our records of "lost time," the most subjective of the factors used in our computation of "catch per unit of fishing effort," was established through comparing the percentage lost time with percentage wind force of 7 or more, as reported by lightships. A correlation of 0.91 between these variables indicated that the variations in lost time were due to weather and not to personal factors. Shifts within the season between Georges Bank and the more distant grounds were found to be closely correlated with water temperatures, apparently due to the difficulty in keeping fish on long trips during the summer, when water temperatures are high. This work completed the primary analysis of our data to show catch per day by months.

The next major step in the abundance analysis was to summarize the data by seasons and years. Preliminary attempts, using the usual arithmetic averages and direct combination, proved unsatisfactory due to monthly differences in level of availability, combined with great variations in the amount of fishing carried on in the several areas and from month to month. The availability through the season was found to follow a consistent pattern throughout the 24 years studied. However, it was found that in years of scarcity the winter fishery suffered much more than the summer, since at such times the winter catch declined 40 percent more than the summer. It was determined that the best seasonal grouping was by 3-month periods, beginning in February. Using this grouping and a weighted-ratio method of combining monthly data which takes care of variations from month to month in the amount of fishing, the seasonal and yearly summarization was completed for the Georges Bank area.

The final step in the preparation of the index curve is an adjustment for the various changes in fishing methods and apparatus that were introduced from 1914 to 1937 in order to make the data on catch per day comparable over the entire period. The adjustment for these changes is of prime importance, since some of the most vital conclusions concerning the productivity of the stock at different levels of abundance depend on a correct determination and comparison of the levels of abundance in early and in recent years.

Most of the work on evaluation of the above changes was completed during 1939. The increased size and power of the trawlers was taken into account by using specific groups of boats over a protracted period, and when forced through obsolescence of boats to change from one group to another the activities of the two groups were overlapped to obtain a measure of relative effectiveness. There also was a change from steam to Diesel power involving a decrease in both gross tonnage and horsepower, but no appreciable change in effectiveness. The effect of Vigneron-Dahl gear, adopted by most of the boats between 1927 and 1931, was evaluated by comparing the productivity of groups of boats before and after installation of this gear. Results showed that the new gear increased performance by at least 29 percent during the winter, and probably more in summer. Evaluations of the influence of the radio, fathometer, and gear competition were partly completed. A study of the effect of changes in the proportion of other species in the catch was partially completed.

*Tagging.*—The tagging experiments commenced in 1938 by Dr. Rousefell were continued. In June 1938, 628 haddock were tagged and released off Mt. Desert Island, Maine, and in June 1939, 538 additional fish were marked in the same locality. Recoveries from both experiments indicate that haddock taken by hook and line from a small boat—insuring careful individual handling—can be tagged successfully when fishing in depths up to at least 30 fathoms. Tagging of fish caught at greater depths has not been attempted. When the new research vessel is completed, the same technique may be applied to the haddock on the shoaler parts of the offshore banks.

Of the number of fish tagged in 1938 experiment, 10 percent were recaptured. Three types of tags were employed and the recoveries consisted of 11.4 percent of the celluloid-disk type, 9.5 percent of the "bachelor button" type, and 8 percent of the internal-anchor type, but the differences in the percentages of recaptures of fish marked by the three methods are not statistically significant. In the 1939 experiment, from which recoveries are still coming in, 10.2 percent of the disk type and 7.3 percent of the button type have been taken to date. The disk type thus seems to be proving slightly superior to the button. In the 1938 experiment, 49 percent were recaptured more than 90 days after their release, 38 percent more than 200 days, and 10 percent more than a year later.

In the 1938 experiment, the locality of recapture was available for 60 of the 63 recoveries. Of these, 52 percent were recaptured within 10 miles of the point of liberation and 65 percent within 20 miles. However, several long migrations were performed, so that although the median distance traveled was only 7 miles, the average distance was 36.7 miles. Since the 1939 experiment has run for only 8 months, the dispersion will not be discussed.

During the summer months the haddock showed a tendency to migrate southwestward along the Maine coast. From the time of their release in June to the end of October there were 37 recaptures at known localities, of which 30 were taken within 20 miles of the point of release, and 7 from 30 to 85 miles to the southwest. From Feb. 28 to May 10, 1939, 6 were taken on Browns and Little La Have Banks, from 137 to 182 miles southeastward of the point of release. This indication of a southeastward spring migration is confirmed largely by the fact that Browns Bank, fished throughout the year, yielded recoveries at only the one season. The recovery of two tags on Georges Bank raises the question of whether the haddock crossed the deep Fundian Channel, separating Browns and Georges Banks, or whether they followed a long, roundabout course by way of Cape Cod and Nantucket Shoals (one fish was taken 130 miles southwestward, on Jeffrey's Ledge), or crossed directly over the Gulf of Maine.

## FLOUNDER

The flounder fishery of the North Atlantic States is based chiefly on 5 species: (1) The lemon sole, *Pseudopleuronectes dignabilis;* (2), the winter flounder or blackback, *P. americanus;* (3), the grey sole or witch, *Glyptocephalus cynoglossus;* (4) the yellowtail, *Limanda ferruginea;* and (5), the dab, *Hippoglossoides platessoides.* In 1937, the most recent year for which complete figures are available, the total catch of flounders reached 59,000,000 pounds, worth nearly

$2,500,000 to the fishermen. Yellowtail contributed the largest poundage (15,000,000 pounds), closely followed by the winter flounder (13,500,000 pounds). The winter-flounder catch was the most valuable ($522,380) followed by the grey sole catch ($510,046).

The greater part of the flounder catch comes from the inshore fishery. In 1937 less than one-third of the total catch was landed at Boston, Gloucester, and Portland by the offshore fleet fishing out of those ports. Consequently, the species of flounder are of great importance to the small-boat and shore fisheries, and during recent years have become of increasing interest to a growing army of sport fishermen, particularly from Cape Cod to Long Island waters.

In 1938 the New York State Conservation Department undertook a survey of the marine fisheries in New York waters. Although the State survey ended in Dec. 1938, Suffolk County, which includes the major part of Long Island waters, provided funds to continue the work on their fisheries until June 1940. A report of the cooperative investigation appears on pp. 27–29 of this publication.

In view of the importance of commercial and sport fishing for winter flounders south of Cape Cod, and the financial cooperation of New York State, it has been decided for the time being to concentrate the work on the winter flounders in that area. It is hoped that facilities will be available in the future to extend the work to other areas and species.

Numerous reports indicate a serious decline in abundance of the winter flounder. To obtain some measure of this decline, determinations of the total catch and catch per unit of effort over a long period of time must be made in order to determine the condition of the stock and fluctuations in the fishery. To discover the factors that influence fluctuations, such biological phases as racial composition of stocks, age and growth, migrations, success of spawning, etc., must be studied.

*Progress during 1939.*—Better records of flounder landings are available for 1939 than ever before, through the action of Maine and Connecticut in installing a system for the collection and publication of monthly records of their fish catches. The coverage of several important flounder ports in Massachusetts also was improved through the collection of records of landings by the Bureau's Market News agents. These developments are of great importance to the flounder work, since the greatest part of the catch of these species is landed at minor ports and is not covered by the Bureau's records for Boston, Gloucester, and Portland.

The excellent reports of landings at the three principal New England ports do not show the fish landed at "T" Wharf, Boston, which include large quantities of flounders. A temporary assistant was detailed to cover "T" Wharf for the month of February to determine the magnitude of the landings. The 4-week total reached 248,000 pounds. According to information obtained from dealers, landings during the summer are considerably higher. Thus, it appears that more than 3 million pounds of fish per year are not included in the Boston reports.

Returns continued to come in from fish tagged in Great South Bay, Great Peconic Bay, Gardiners Bay, and Long Island Sound, in New York waters, as well as from fish tagged in Connecticut and Rhode

Island waters. During 1939 a series of fish also was tagged in John's Bay, Maine. In general, tagging experiments indicate offshore migrations of the winter flounder in the spring, and inshore spawning migrations in the fall. Although there was some slight dispersion of fish from local areas, the majority never ventured far from home waters.

Racial studies of the flounders in the Long Island area, during the summer of 1939, confirmed the existence of local populations in the Peconic Bay, Great South Bay, and Long Island Sound regions, as indicated by the tagging experiments.

### ANALYSIS OF GROUNDFISH ABUNDANCE

The groundfish abundance analysis was continued under the direction of Dr. Rounsefell, who was assisted by Mr. Bearse. During 1939 the fishing vessels landed 376,000,000 pounds of groundfish at Boston, Gloucester, and Portland. Compared with 1938, when 379,000,000 pounds were landed, this represents a decrease of less than 1 percent. However, the value to the fishermen rose from $8,352,000 in 1938 to $9,017,000 in 1939; an increase of 8 percent.

An outstanding feature of the 1939 fishery was the continuing expansion of the rosefish catch. In 1933 the catch was less than 300,000 pounds, and in 1934 it was just under 2,000,000 pounds. In 1935 the filleting of rosefish gave the product access to the markets of the Midwest—where they are sold as "ocean perch"—and the catch rose to 17,000,000 pounds. In 1936 it jumped to over 66,000,000 pounds, which was almost too large for the market to absorb. In 1937 the catch fell off to 58,000,000; in 1938 it was 65,000,000 pounds; and in 1939 was 77,600,000 pounds.

During 1939 the large otter trawlers, which have a long cruising radius, commenced taking large quantities of rosefish off eastern Nova Scotia, especially in The Gully, just south of Banquereau. From July to December 1939, this area accounted for over 8,400,000 pounds, or 58 percent, of the rosefish catch of the large trawlers, whereas it accounted for only about 1 percent of their catch during like periods in 1937 and 1938.

The various species of groundfish form the basis of the most important New England fisheries. Although it has been known that the total yield has fluctuated, our knowledge has been too limited to know the causes, or which species are most affected. The shift in the fishery within the past few years toward rosefish and grey sole, for instance, presents the problem of discovering what effect these changes are having on the species that were already being intensively exploited. Indices of abundance are being determined for each species, which are so constructed that they may be added to from month to month to show any sudden changes. Under a system which made only irregular summaries of abundance those changes might be unnoticed for a long period. When the indices are completed, however, it will be possible, as soon as the requisite knowledge of the life history becomes available for each species, to suggest means of maintaining the population at that level which will yield the largest sustained annual catch.

The study of the three variables—total catch, fishing effort, and abundance—is difficult in a fishery that covers such a wide geographical area. At times the fleet operates in comparatively shallow water, and at other times in deep water, and the species taken vary accordingly. Also, some species are more available to the fishermen at certain seasons than in others, so that only comparable seasons yield valid comparisons. Since the welfare of thousands of New England fishermen, shore workers, and fillet cutters depends on the maintenance of this tremendous fishery, it is essential that we understand the factors responsible for changes in yield. Not only can that knowledge help to prevent a decline similar to that suffered by the North Sea fisheries, but it can also deter the enactment of irresponsible legislation which is sometimes a "stop-gap" not based on complete knowledge of the facts.

*Statistics.*—The first step in assessing the condition of this fishery is to obtain information on the yield. Since even the same species may have independent stocks on different banks, it is necessary to know the quantities caught in each area. This information is obtained for all boats of over 5 net tons landing at Boston, Gloucester, or Portland, and is published monthly by the Division of Fishery Industries. It also gives an excellent summary showing the type of gear used and the bank where caught. The landings at these three principal ports comprise about 65 percent of the New England landings, and all but a small fraction of the offshore catch. The information on fishing banks was brought up to date in 1939 by making several slight changes in the boundaries of statistical subareas based on the grounds fished by large otter trawlers in 39,632 days of fishing from 1928 to 1937, inclusive. A 1-year trial of the new boundaries has shown that they conform more closely with the natural fishing areas than those previously adopted.

Until 1939 the only available records of the total New England catch have been those of the Bureau's annual canvass. However, due to limited personnel and funds, this canvass cannot achieve the desired degree of accuracy, since it is made only once a year at the end of the season and many of the fishermen from whom records are obtained do not keep accurate accounts. Furthermore, such annual statistics do not show the season or the locality of the catch.

In cooperation with the Division of Fishery Industries, the North Atlantic staff has encouraged the installation of adequate statistical systems by the New England States. The State of Maine installed a system on Jan. 1, 1939, whereby the dealers use triplicate receipt books, furnished by the State, for each purchase of fish. The State collects one copy of each transaction at the end of each month. The State of Connecticut commenced a similar system during the year. The Market News Service of the Bureau now obtains information on all landings at Provincetown and New Bedford, Mass. Although there is still much work to be done, the progress made during 1939 will assure the most complete statistics so far obtained on the New England fisheries.

*Fishing effort.*—The amount of fishing effort expended in relation to the volume of the annual catch is of great importance in studying the trend of a fishery. The changes in type of gear and in the size and style of fishing boats should also be known. Such information provides a perspective for analyzing the state of a fishery. The catch, tabulated according to vessel and size and type of gear, is being compiled from the reports of landings at the three principal New England ports. Data have been assembled for all except 2 years of the 1927–39 period.

A comparison has been made between the catches of 1927 and 1938. During 1927 the average number of vessels that landed each month was 218 (including a total of 364 boats). The average was computed on a 12-month basis so that in the purse-seine fishery, for example, if 60 boats fished 6 months the average for the entire year would be 30 boats. If a boat used two types of gear during the same month, each gear has been credited with half a month. The average number of boats that landed catches each month during 1938 was exactly the same, 218 (332 different boats landed). Not only was the same number of landings made in 1927 and 1938, but the average gross tonnage per individual boat was 96 in each year.

However, there was a 50 percent increase in the landings of all species, from 268,000,000 pounds in 1927 to 401,000,000 pounds in 1938. This appears to have been due largely to a radical change in the proportions of each type of gear used. All forms of gear except otter trawls and sink gill nets decreased in numbers. Hand-lining accounted for an average of 10 boats fishing throughout 1927, but that method of fishing had practically disappeared in 1938. The average number of purse seiners decreased from 35 to 20. The line trawlers decreased 34 percent in number and 52 percent in gross tonnage. This apparent discrepancy is accounted for by a decrease from 49 to 23 in the line trawlers of over 50 gross tons, but an increase from 8 to 15 in the average number of smaller line trawlers. The number of otter trawlers increased 60 percent, from 76 to 121, due largely to the building of new boats, although, to a lesser extent, it was also due to the present practice of operating a boat throughout the year. In addition, several line trawlers were converted for otter trawling. The medium-sized otter trawlers in operation, 51 to 150 gross tons, increased from 22 to 34, or 55 percent; the large, from 24 to 40, or 67 percent; and the small otter trawlers from 30 to 47, or 57 percent. Thus, the large trawlers showed the greatest increase in numbers. In 1927, with an average of 24 large trawlers in operation, 88 percent were propelled by steam. In 1938 steam accounted for only 24 percent of an average of 40 large trawlers, the balance being Diesel-powered.

Other factors in addition to the shifts in type of gear contributed to the 50 percent increase in landings. One was the adoption by the otter trawlers of the Vigneron-Dahl trawl, which increased their catches considerably. A second factor is the newly developed fishery for rosefish, which produces a greater poundage per unit of effort than any other species.

*Population estimates.*—Having laid the ground work for the determination of total catch by season and area, and of total fishing effort, there remains the third variable—abundance.

Very fortunately the haddock investigations, as one phase of their activity, commenced collecting data at the Boston Fish Pier in 1932 that are of great value to the groundfish analysis. The phase of the haddock work dealing with abundance will henceforth be carried on as a part of the determination of abundance of all species of groundfish.

At the Boston Fish Pier the captains of all vessels of over 50 gross tons are interviewed at the end of each trip. The data listed includes the day and hour of departure and arrival at the pier; the fishing locations by rectangles covering 10 minutes of latitude and of longitude; the depth fished; the number of hours of fishing time lost through bad weather, engine trouble, or other causes; the proportion of time spent on each bank; and the proportion of the trip (and of most of the species caught) on each bank. For line-trawl vessels the number of tubs of gear set on each bank and in each depth also is obtained. These interviews are now being made by Mr. Bearse. During 1939 the catches were allocated to their appropriate subarea and depth zone, and the fishing time for selected groups of otter-trawl vessels was calculated. The calculated number of fishing days and catch allocations were added to the punch cards used by the Division of Fishery Industries in tabulating the material for its monthly bulletin on the landings at the three principal New England ports according to fishing bank and type of gear. As soon as the indices of abundance by species for the 1932–38 period are completed it will be possible to follow the changes in abundance from month to month.

For the two selected groups of large otter trawlers, the catch and number of days of fishing in each statistical subarea during each month has been taubulated, according to depths fished, for the period 1932–38, inclusive. One group of trawlers is slightly over 90 percent as efficient in fishing ability as the other group. By making an allowance in the number of fishing days, it is possible to place the two groups on an equal basis and to combine the data for final analysis.

The determination of abundance is further complicated, however, by the necessity of analyzing the data according to the depths fished, inasmuch as different species vary in their choice of habitat. Accordingly, all catches have been allocated to 3 depth zones, namely: Shallow, 0 to 30 fathoms; medium, 31 to 60 fathoms; and deep, over 60 fathoms.

The analysis of trips for area XXII—the banks of the Gulf of Maine, Georges Bank, and Nantucket Shoals—in which the otter trawlers fished wholly within 1 depth zone and 1 statistical subarea, show that although most species vary considerably in abundance in the different depth zones, this is not true for haddock. Giving each depth zone an equal weight, the relative abundance of large haddock on the basis of 100 percent was 35 for shallow water and 32 for both medium and deep water. Scrod haddock had a relative abundance of 37 for shallow, 40 for medium, and 23 for deep water. This may be an artifact, because, since haddock represent over 60 percent of the catch, the fishermen are seeking locations where they are most abundant and fish each depth most intensively at the time when haddock are most abundant there.

The flounder group—blackbacks, lemon sole, and yellowtail—definitely prefer shallow water, and yielded percentages of 88, 72, and 76, respectively, as compared to 11, 23, and 20 for medium depths, and only 1, 5, and 3 percent for deep water. Grey sole and dabs, on the other hand, are deep-water species; 84 and 69 percent coming from over 60 fathoms. Cusk, pollock, and hake are all taken in much greater quantities in deep than in shallow water. Almost 100 percent of the rosefish are likewise from the deep zone.

As soon as the data can be analyzed for seasonal abundance, and for varying degrees of abundance according to geographical location, the final curves of annual changes in abundance will be determined. For a few species, such as cusk and hake, which are taken only in small quantities by the otter trawlers but in large quantities by hook and line, we may have to depend largely on the analysis of the catches of line-trawl vessels. Data showing the number of tubs of gear fished by selected line trawlers and their catch for each depth and subarea have already been assembled for 6 of the 7 years under consideration, and will be analyzed in a like manner.

### LOBSTER

The lobster fishery is of paramount importance to the shore fisheries of the North Atlantic States, since it furnishes all or part of the income of great numbers of small-boat fishermen from Maine to New Jersey. In 1937 this fishery produced a catch of over 11,500,000 pounds, worth nearly $2,500,000. Fifty years ago the catch was nearly three times as great, but it has declined in spite of protective regulations in all States, and artificial rearing in some.

The research program began in March 1939, with the employment of Leslie W. Scattergood to carry on the investigations. The program has been divided into two main parts—the first dealing with hatchery and rearing methods and the second with the study of the Maine lobster population to obtain biological data necessary for the most effective management of the fishery.

More than one-half of the total catch is accounted for by the Maine fishery. The records collected by the Maine Department of Sea and Shore Fisheries showed the catch in 1939 to be 6,625,000 pounds, compared to about 23,000,000 pounds 50 years previously when the fishery was much less intensive. Because of the importance of this species to the fishermen, and the need for the adoption of measures to attempt to maintain the yield, the State of Maine constructed a large rearing station at Boothbay Harbor in 1938 and 1939, and in the latter year joined in a cooperative lobster-research program with the Bureau of Fisheries. The object of the investigations undertaken was to develop improved methods of rearing lobsters and to obtain data that would assist in the determination and establishment of an adequate minimum-size limit.

Experimental rearing to the fourth stage was conducted at the hatchery under different conditions of temperature, light, and food, but, due to unnatural water conditions present in the rearing station, the work was beset with difficulties which were only partially overcome at the end of the rearing season. Further experimental rearing, under more suitable conditions, will be attempted during the spring and summer of 1940.

The commercial catch of lobsters was sampled along the entire coast of Maine from Cape Porpoise to Cutler. The sex and carapace length, as defined by State laws, were recorded for over 15,000 lobsters. From these samples it was found that 12 percent of the number had a carapace length of less than 3⅛ inches, 34 percent under 3¼ inches, and but 8 percent above 3¾ inches. Measurements of seed lobsters taken along the Maine coast indicate that they do not mature before they reach a length of 3¾ inches; in many regions we have reason to believe that sexual maturity must be first reached at a length greater than 3¾ inches. It appears that only about 8 percent of the population has an opportunity to spawn. Further research must be carried on concerning this problem.

As a result of a request from the North Atlantic Lobster Committee to "assemble information concerning size limits and begin the research work required to obtain additional biological information necessary for sound recommendations concerning size limits," certain data were gathered during the summer and fall fishing season. These observations consisted of a determination of the size composition and sex ratio of the commercial catch, length-weight relationships, the relationship between the length measurements from eye socket to end of the carapace and total length measured from the tip of the rostrum to the end of the tail, and size measurements of seed lobsters. As seed lobsters proved to be difficult to find in any numbers during the summer and fall, an indirect method of determining the sexual maturity was employed which was based on the fact that the width of the female's abdomen increases at a higher rate than body length with the approach of sexual maturity.

The present size regulation of $3\frac{1}{16}$ inches, carapace measurement, allows the capture of small, immature lobsters which results in an economic as well as a biological waste. A 3¼-inch lobster weighs 1 pound, on the average. The important summer and fall fishery depends upon lobsters under 1 pound for 34 percent of its numbers. These small "chicken" lobsters are not in demand on the markets and a general lowering of the prices occurs with the overabundance of undesired sizes.

Tagging experiments were carried on to determine the interdependence of local populations and to measure the intensity of the fishery. A total of 413 lobsters were liberated in three groups in Boothbay Harbor; one lot in July, another in August, and a third in November. The recoveries were 27, 55, and 31 percent, respectively. The first percentage recovery is not comparable to the second and third, as the lobsters of that group were near the shedding stage, at which time they would lose the tags. One hundred lobsters were released in the Sheepscot River, a long tidal estuary, during October and a 7-percent recovery resulted by the end of December. On the offshore fishing grounds of Sheepscot Bay, 186 lobsters were liberated in July and 100 in December. Recoveries of 12 and 3 percent, respectively, were made by the end of the year.

It is too early for the final results of the tagging to be known, as more tagged lobsters are expected to be caught during the summer and spring of 1940. At the present time, the longest migration has been 3½ miles, and two facts are evident from the tag returns: First, there is very little migration during the summer and fall months; and, second, the intensity of the fishery may vary in different regions, depending upon the season and the number of traps fished in an area.

Although records of daily catches and the number of lobster traps fished by the entire industry are not available for the year, certain lobster dealers have kept daily records of the catches of their fishermen, thus providing a means of sampling the poundage yield per trap unit.

## MIDDLE AND SOUTH ATLANTIC FISHERY INVESTIGATIONS

ROBERT A. NESBIT, *in charge*

A few years ago it would have been correct to state that the principal objectives of conservation administration in the Middle and South Atlantic region are: To protect the interests of the consuming public in an abundant production of food fish and to promote the welfare of the commercial fishermen. Today, however, it is necessary to add a third objective—to protect the interests of salt-water anglers. The number of anglers has increased greatly in recent years and many active organizations which are very influential in matters of conservation legislation and administration have been formed.

It has often been pointed out that the interests of the consuming public, the commercial fishermen, and the anglers are identical in that they are best served by the maintenance of high levels of abundance. Also it has frequently been indicated that the only controllable influence on abundance is the fishery itself, and that the only effective means of exercising control is by management of the intensity of the fishery.

That it makes a great deal of difference how the intensity of an excessive fishery is reduced is a point that is repeatedly overlooked. Complete elimination of commercial fishing would protect the interests of anglers, but obviously would be contrary to the interests of the consuming public and the commercial fishermen. Measures designed to reduce excessive fishing by requiring commercial fishermen to use inefficient methods, that is, by making it unprofitable to fish excessively, protect the interests of the public and the anglers but are unsatisfactory to commercial fishermen.

It is apparent, therefore, that if effective cooperation of all interested groups is to be obtained it will be necessary not merely to eliminate overfishing but also to eliminate it by some means which will not only protect the fish but will also protect the profits of commercial fishermen.

Since the cost of fishing is almost directly proportional to the amount of gear operated, the most economical method of decreasing fishing intensity is to reduce the amount of gear employed to a minimum. Recent recommendations by the Middle Atlantic staff, based on this principle, have been received favorably by commercial fishermen in Chesapeake Bay. It is possible, therefore, that such proposals will provide a basis for better cooperation between anglers and commercial fishermen.

As in previous years, office and laboratory space was provided by the University of Maryland. In the conduct of these studies much voluntary cooperation has been received from the conservation departments of several States and from organizations of commercial fishermen, sports fishermen, and dealers. Special thanks are extended to the conservation departments of Rhode Island, Connecticut, New York, New Jersey, Maryland, Virginia, North Carolina, and South Carolina. The staff also profited greatly by the cooperation of the

Narragansett Biological Laboratory and its director, Dr. Charles J. Fish, and the Chesapeake Biological Laboratory and its director, Dr. R. V. Truitt.

### SHORE FISHES

Investigation of the shore fishes of the Middle Atlantic region during 1939 was continued by William C. Neville. The work included a study of fishery problems in Long Island, N. Y., conducted in cooperation with Suffolk County (reported on pp. 27–29 of this publication), and observations on the winter trawl fishery off the Virginia Capes.

*Winter trawl fishery.*—The year 1939 marked the eighth anniversary of the winter trawl fishery off the Virginia Capes. The establishment of this activity as a permanent part of the industry is indicated by continued large annual production. Approximately 18,000,000 pounds of fish were landed at the principal ports in Virginia, New Jersey, and New York during the 1939 season. This high level of catch has been maintained during the past several years. The most pressing need in the study of the probable effect of the winter fishery on the general supply of sea bass, scup, fluke, and croakers, which species comprise the major part of the catch, is to devise saving methods to release undesirable market sizes of fish, in good condition, at sea. It is hoped that such savings work can be started in the near future through the use of the trawler recently acquired by the Bureau and now being remodeled and equipped at Boston.

### ANADROMOUS FISHES

*Striped bass.*—The principal objectives of the striped bass study conducted by William C. Neville in 1939 were: (1) Continuation of the studies which led to the Bureau's recommendation of a minimum size limit of 16 inches, measured from the snout to the fork of the tail (approximately 17½ inches overall), as the best means of securing greater yields and larger profits from each brood of striped bass, regardless of its relative abundance. (2) To determine the extent to which the available supply in the various States depends on local reproduction, or on migrations of fish from other parts of the coast, and whether, on the basis of the source of the supply and the extent of withdrawal by the fishery, more restrictive or protective legislation is necessary for the proper utilization of the supply.

Mainly as a result of the Bureau's recommendation, the legal limit of striped bass was raised to 16 inches, fork length, in New York State during 1939. A slightly higher size limit is in effect in New Jersey. Recommendations for substantial increases in the legal size limit for striped bass have been submitted to the fishermen by the Virginia Commission of Fisheries, and similar action is expected in Maryland and North Carolina. These three States comprise the most important striped bass production area along the entire Atlantic coast. Analysis of biological data obtained through tagging experiments reveals that the fishery is so intensive in certain parts of Chesapeake Bay as to remove a considerable quantity of the small sizes of bass. Hence, it is particularly important that Virginia and

Maryland increase their size limit to the Bureau's recommendation of 16 inches to insure more efficient utilization of the supply. The increased size limit will result in a greater total catch and value, provided by an equal number of fish of the same year class.

A survey of the coastal regions of Chesapeake Bay to southern New England during 1939 confirmed conclusions resulting from previous study that not all important areas for striped bass furnish their quota of young to replace the larger-sized fish removed by the fishery. Spawning grounds of significant importance were located in the Maryland waters of Chesapeake Bay, Delaware Bay, and the lower Hudson River in New York. According to studies made in previous years, the lower Chesapeake Bay and the sounds and coastal rivers of North Carolina are also productive areas. Results of the survey in 1939 indicated a notable lack of successful reproduction of striped bass along the ocean coasts of New Jersey, Long Island, and southern New England. These observations suggest that the adult stock in these latter regions originates mainly from the migration of young fish from the more productive spawning and nursery areas of Chesapeake Bay, and possibly Delaware Bay and the Hudson River.

The survey also revealed that spawning in 1938 and 1939 in the important Chesapeake Bay region was relatively unsuccessful, despite the fact that the spawning stock was one of the largest on record. This was in marked contrast to the unusually successful reproduction that occurred in 1934, when the stock of adult fish was relatively low. This disclosure supports the results of previous studies in that the production and survival of young striped bass are, to a large extent, independent of the number of spawners, and hence regulatory measures to increase the spawning stock are not of primary importance in the proper conservation of the species. The Bureau's recommendation of a 16-inch size limit will, however, increase the number of spawners, but it is intended more specifically to insure better utilization of each brood. Results of the study of spawning and nursery areas for striped bass, and of tagging experiments to determine the extent of the withdrawal on the stock and additional information on the seasonal migratory habits of the species, have been considered in connection with the question of whether more restrictive legislation intended to improve or maintain the abundance of striped bass is necessary in some of our Atlantic Coast States.

*Shad.*—Further study in 1939 confirmed the opinions expressed in the report for 1938 to the effect that the principal cause of depletion is overfishing, rather than pollution or obstruction of runs, and that recovery can best be brought about by providing a spawning escapement substantially equivalent to that which has proved adequate in the Hudson River.

Study in 1939 also brought out the important point that the moderate fishing rate in the Hudson eventually takes as much shad from each year class as the more intensive fishery in Chesapeake Bay, but spreading the catch over several years allows six times as much spawning from each year class.

In December 1939, a memorandum was submitted to the conservation departments of Maryland, Virginia, and North Carolina, summarizing the results of the shad studies in 1938 and 1939 and making recommendations as follows:

> For the restoration of the shad fishery of Maryland, Virginia, and North Carolina, then, the Bureau recognizes the following fundamental facts and principles: (1) The decline in shad production in Maryland, Virginia, and North Carolina is the result of overfishing. (2) To correct overfishing of shad the annual toll taken by the fishery should be reduced to 60 percent of the present rate. (3) This should be accomplished by restricting the amount of gear operated so that the fishermen will be spared the uneconomic practice of purchasing and operating more gear than is required to take the annual harvest.
>
> In accordance with these principles it is specifically recommended: (1) That appropriate steps be taken by the States to secure necessary additional detailed information as to the amount, the location, the period of operation, and the catch of existing gear in order to accomplish equitably this reduction in fishing gear; (2) that when sufficient detailed information is available appropriate legislation be enacted to accomplish the reduction in gear on a trial basis and to modify such regulations as experience accumulates; and (3) that no expenditures be made for enlarging permanent hatchery facilities and that existing hatcheries be operated strictly on a salvage basis until natural reproduction has been restored.

Investigations of the early life history of the shad were made at the Charleston (S. C.) Office by Louella E. Cable. Because the survival of eggs and young of shad will determine the number of spawning fish required to maintain or build up any given population, studies were designed to determine the survival rates. A survey of the Edisto River, and preliminary plankton collections in 1938, revealed the best spawning areas of the river and provided material from which it was learned that large numbers of eggs are not fertilized and that the survival rate may be as low as 1 percent.

Two stations, one at the upper limit of the spawning area and the other near its center, were sampled intensively during the 1939 shad season for evidence of a possible differential in survival rate, but none was noted. With slight variations, findings of the previous year were substantiated. In 1940 the same central station will be sampled as in 1939 and two lower stations will be added, one to be located in brackish water.

The shad population of the Hudson River, N. Y., has shown, within the past few years, a phenomenal increase as reflected in the commercial catch. Does this indicate a higher survival rate of the eggs and young in the Hudson than has been found in the Edisto River, or is the increase entirely due to a larger escapement of spawners? To better understand the change, it is planned to work on the Hudson in the near future.

Racial studies based on meristic characters, made by Miss Cable, indicate the existence of several populations of shad along the Atlantic coast. These studies will go far in corroborating evidence obtained from tagging experiments and scale readings.

## FISHERIES OF SOUTH CAROLINA

Fishery research at the Charleston office, which is in charge of John C. Pearson, concentrated upon fundamental studies of the distribution and abundance of the eggs and young of the shad in Southern coastal rivers, particularly the Edisto River. Several secondary fields of research also present themselves to the trained fishery observer as worthy of investigation. Such research may properly be conducted with the present facilities at Charleston.

It is a matter of general knowledge that the largest hydroelectric development in the Southeastern States, the Santee-Cooper project, is now under way. It is proposed to divert at least one-half of the normal flow of the Santee River over a series of dams into the headwaters of the Cooper River, a tributary of Charleston Harbor. Although the Santee River system is not important from a fishery standpoint, important and perhaps far-reaching ecological changes will take place not only in the lower regions of the Santee but also in the Cooper River. So far, little has been said of the effects of the diversion with respect to the Cooper River, although the U. S. Bureau of Biological Survey realizes the effects of the project on the wildlife, particularly ducks, of the lower Santee River.

The Cooper River, a relatively new and large coastal river created by man, now largely of estuarine character and possessing salt or brackish water, will become fresher with the incursion of fresh water from the Santee River. Aside from becoming a problem of immense interest from a strictly ecological standpoint, probably the most striking change effected by man on an estuarine environment, certain features of practical consideration come to mind. The most valuable aquatic resource in South Carolina is the marine shrimp, *Penaeus*, and nearly 2 million pounds of this crustacean are taken annually in coastal waters of that State. Research has indicated that estuarine areas along the coast are essential nursery grounds for young shrimp after they have been spawned at sea and are carried into shallow inshore estuaries. The young shrimp require salt or brackish water in a shallow, muddy environment for adequate survival and growth. The estuarine area of the Cooper River provides one of the important shrimp nurseries along the South Atlantic coast. Its contribution to the supply of shrimp in this region may be considerable because millions of shrimp utilize this area for growth, shelter, and development.

The investigative problem is to determine the effect of the constant influx of fresh water upon the environment, especially the nursery areas. Obviously, the salinity of the brackish areas will be reduced, and it is important to know whether this will cause any decrease in the annual catch of shrimp along the coast.

Another secondary problem which could be pursued within the field of fishery biology at Charleston concerns the fishery for sea bass or blackfish. The latter are taken locally on coral reefs off the coast and are probably independent populations from those of more northern areas. The fish are captured solely by hook and line and comprise the third most valuable fishery within the State.

A study of the size and age composition of the catch, correlated with the location of the catch, might throw light on one basic point in modern fishery biology, e. g., does overfishing occur on some reefs, as might be indicated by a lower size and age composition of the fish population, when accompanied by a decrease in catch per unit of effort? Studies of the sea bass stocks to determine such fundamental facts might prove profitable.

## SUFFOLK COUNTY COOPERATIVE INVESTIGATION

WILLIAM C. NEVILLE, *in charge*

During the year 1938 a survey of the marine fisheries of Long Island waters was conducted by the New York Conservation Department, assisted by the Bureau. Public interest aroused by that survey led to an appropriation of $6,750 by the Board of Supervisors of Suffolk County, N. Y., for a study in cooperation with the Bureau, of the local fishery problems of that county. The investigation, planned to continue until June 1940, was under the joint supervision of William C. Herrington and Robert A. Nesbit and directed by William C. Neville, of the Middle Atlantic staff. He was assisted by Milton J. Lobell, of the North Atlantic staff, who continued the flounder studies until September 1939, when he was transferred to the U. S. Department of the Interior Antarctic Expedition. Alfred Perlmutter, who was appointed to the North Atlantic staff in December 1939, resumed the flounder investigation.

The studies undertaken will be of value not only to the county but elsewhere in the middle Atlantic region where similar problems occur. The main objectives of the study are as follows:

1. To determine whether any serious decline in the abundance of winter flounders is occurring, and what remedial measures are desirable to maintain a high level of abundance or to insure the best use of the local supply. In this study attempts are being made to determine the effectiveness of planting hatchery-reared fry in an effort to increase or maintain good catches; the desirability of increasing the legal size limit from 6 to 10 inches, and whether current fishing practices result in any great mortality of illegal or unmarketable sizes of fish that are discarded at sea.

2. To determine whether an increase in the size limit on weakfish from 9 to 12 inches would improve the catches of larger-sized fish of greater market and recreational value.

3. To seek practical saving methods to curtail the destruction and waste of illegal and undesirable market sizes of fish.

Favorable progress has been made on all three main objectives. In the winter-flounder study, information collected during 1937 and 1938, supplemented by data in 1939, indicates that different regions of Suffolk County have independent population units, so that efforts to improve fishing conditions can be applied directly to individual areas. Marked differences in the rate of growth of flounders occur in these separated regions, thus permitting determination of the probable benefits to each region through increases in the legal size limit. Frequent contacts during the past 2 years with commercial and sport fishermen of Suffolk County have resulted in much personal interest in the study, and through individual cooperation accurate catch-record data are expected to be available for determining the extent of fluctuations in amount of catch.

The question of whether benefits can be derived by increasing the size limit of weakfish from 9 to 12 inches can be answered in part on the basis of results of the Bureau's study of this species since 1928, and of the biological survey of Long Island made in cooperation with the New York Conservation Department in 1938. Releasing weakfish less than 12 inches in length in New York waters would result in at least some of these fish returning to New York waters as larger-sized weakfish. It is still uncertain, however, whether the gains would fully compensate for the losses. Weakfish are delicate and many would not survive sorting by hand. Progress has been made in adapting the "sifter" method long used by Rhode Island trap operators, not only to small weakfish but to butterfish as well. As much as 80 percent of the smaller sizes can be released by sifters of appropriate mesh more quickly than by hand sorting, and with less mortality. Unfortunately, this method is not applicable at all seasons, for at times the runs are made up of several species so that sifters of appropriate mesh for one species will permit the escape of marketable sizes of other species or will cause objectionable gilling. Results of these studies will be included in a report to be submitted to the Board of Supervisors of Suffolk County by July 1, 1940.

## SHRIMP INVESTIGATIONS

MILTON J. LINDNER, *in charge*

During the past several years the shrimp fishery has been characterized by the rapid expansion of the market for the "fresh-headless" product. This industry first came into prominence along the Atlantic coast in the early thirties. With the initiation, in the winter of 1937–38, of an offshore fishery in Louisiana for the large-sized shrimp, generally known as "jumbo," this phase of the shrimp industry has now become of considerable importance in the Gulf of Mexico. The rapid rise in the fresh-headless shrimp business, together with a growing demand for canned shrimp, has led to considerable increase in fishing effort. The augmentation of fishing, due to the increase in the number of boats, size of craft, and the efficiency of their operation, has placed a strain on the supply of shrimp along the Atlantic coast. The greatly increased fishing intensity has not resulted in an appreciable increase in the catch, but, on the contrary, it has resulted in a decrease in the catch of the individual fisherman with respect to the amount of effort expended. In Florida the increased intensity has resulted in a lesser total catch during the winter fishery, which is composed of migrants from North Carolina, South Carolina, Georgia, and northern Florida. Apparently the fishery on the Atlantic coast is so heavily prosecuted that a great proportion of the migrant shrimp are captured by the fishermen before they reach their wintering ground between St. Augustine and Cape Canaveral, Fla.

Extreme competition, together with the discovery of jumbo shrimp off the Louisiana coast, has led a number of Atlantic coast shrimp boats to migrate to Louisiana to enter the offshore fishery. The Atlantic coast shrimp vessel is much better suited for the offshore work than is the Gulf-style shrimp boat which has been developed for use in the shallow inland bays and bayous.

During 1939, as in previous years, the shrimp investigators were furnished office quarters by the Louisiana Department of Conservation, at New Orleans. The city of Gulfport, Miss., supplied dockage and storage space for the *Pelican* and its gear. Due to the curtailment of funds it was necessary, in February, to temporarily suspend the Texas investigations which were being conducted in cooperation with the Texas Game, Fish, and Oyster Commission. For the same reason the tagging operations with *Launch 58* and the exploratory work with the *Pelican* were interrupted during February and March, respectively. Both boats were again placed in commission after

July; the *Pelican* for a brief period during August and *Launch 58* continuously, for tagging purposes.

Through the cooperation of Dr. R. Dana Russell, School of Geology, Louisiana State University, the bottom-core and mud samples collected with the *Pelican* are being examined. In addition to an analysis of the chemical and physical characteristics of the bottom deposits by Dr. Russell, the Foraminifera, Bryozoa, and Ostracoda will be identified by Drs. Howe and McGuirt of the School of Geology. Through Dr. H. N. Fisk, Louisiana State University, the mollusc collections are being identified. The salinity samples are being analyzed by Professor Albert E. Parr, of the Bingham Oceanographic Institute.

With the interruption of the Texas work, field operations have been restricted to exploratory work with the *Pelican* in the offshore waters of the Gulf and tagging experiments with *Launch 58*. M. J. Lindner and W. W. Anderson conducted the studies made with the *Pelican* and Albert Collier of the Texas Game, Fish, and Oyster Commission assisted during the Texas cruise. C. H. Baltzo has been conducting the Gulf tagging experiments. From June 17 to December 9 Mr. Lindner was detailed to Mexico to assist the Mexican Government in some of their fishery problems.

Messrs. Lindner and Anderson examined and identified the entire collection of penaeid shrimps collected with the *Pelican* in the Gulf of Mexico. This collection contained 16 species of Penaeidae, only 4 of which ever enter the commercial fishery. One, the common shrimp (*Penaeus setiferus*), comprises at least 95 percent of the commercial catch, and all discussion in this report refers to that species.

Information of considerable value was made available during 1939 by the publication entitled, "The early life histories of some American Penaeidae, chiefly the commercial shrimp *Penaeus setiferus* (Linn.)", by John C. Pearson.

## OFFSHORE OPERATIONS

Because of the constantly increasing drain on the shrimp population it is particularly important to know whether or not there is a reserve supply of shrimp available beyond the range of the present commercial fishery. The recently developed fishery off the Louisiana coast is a direct result of the studies carried on by these investigations. The possible discovery of additional and similar concentration areas will prove of immediate economic importance to the industry. If such additional areas do not exist it is of both biological and economic significance to know this fact. Future expansion of this fishery will depend appreciably on the presence or absence of additional virgin fishing grounds, and no well-founded management can be attempted without complete knowledge pertaining to the distribution of the shrimp and the limits of its range. The possibility of an offshore spawning reserve can be determined only by fishing in depths greater than those now exploited by the fishing boats.

In an attempt to solve these problems the *Pelican* was used between January 14 and March 15, 1939, to explore the area between the beach and the 100-fathom contour from the Mexican border to Carrabelle, Fla. Throughout this stretch of bottom 380 hauls, of one-half hour duration each, were made with a 9-foot otter trawl. The trawl actually was dragged over 1,200 miles of ocean floor. In addition to trawling, the *Pelican* occupied 70 hydrographic stations at which 158 salinity samples, 51 Petersen dredge samples, 51 mud samples, and 20 bottom-core samples were taken, together with temperature observations at each station.

Again, as in 1938, concentrations of large shrimp were found off the central Louisiana coast near the 10-fathom line between Ship and Trinity Shoals. No comparable aggregations were found along the entire length of the Texas coast. East of the Mississippi River, between Mobile, Ala., and Carrabelle, Fla., the catch was even less than along the Texas coast. At no time were common shrimp taken in depths greater than 15 fathoms.

These results indicate that the common shrimp does not go to any great depths; that the shrimp boats working in the offshore Louisiana area extend their fishing operations to the outer limit of the range of the common shrimp; that there appears to be little likelihood of other offshore fishing areas being developed in the Gulf with a magnitude comparable to that now present between Ship and Trinity Shoals; and that bottoms composed primarily of sand, shell, or coral do not provide a suitable habitat for the shrimp.

Since it has been determined that the common shrimp does not inhabit areas in the Gulf of Mexico that are outside of the range of operations of *Launch 58*, it was decided that further work with the *Pelican* would be unnecessary in the Gulf. However, similar offshore studies on the distribution of shrimp along the Atlantic coast also are needed, for the same reasons that they were required in the Gulf. The *Pelican* will be transferred to the East coast in January 1940, for the purpose of performing exploratory trawling out to the 100-fathom contour between Fort Pierce, Fla., and Cape Hatteras, N. C. When this exploratory work has been accomplished we will be in a position to recommend what, in our judgment, appears to be the best method for the management of the Atlantic coast shrimp fishery.

### MIGRATION STUDIES

As shown by tagging experiments, the Florida winter fishery is comprised of migrants from as far north as North Carolina. Before the migrating shrimp can reach their Florida winter ground they first must run the gamut of the fishery along the entire stretch of coast from their nursery ground to their winter ground. The fishing intensity has been so severe during the past few years that only a small portion of the shrimp that start out on this migration ever reach their objective.

Since the shrimp definitely is migratory, the solution of the Atlantic coast problem lies not within the individual responsibility of any one State but must be the accomplishment of unified action on the part of all four of the States involved. Until the current year, although suspected, it was not known whether similar united action would be advisable in the Gulf of Mexico in case the need arose. However, tagging experiments conducted in Louisiana, Mississippi, and Alabama, during 1939, have shown that the shrimp populations in these three States move from one State to another. Here, again, we have the necessity for two or more States to unite in their efforts to properly regulate a migratory fishery.

Inasmuch as the common shrimp does not possess any of those structures common to many fishes and molluscs by means of which the age of an individual specimen can be determined; and inasmuch as the shrimp apparently has a relatively short life span, an extended spawning season, a complex migratory nature, and the habitat changes markedly during its life span, many problems concerning its life and habits can be solved only by means of tagging. The problem of growth is complicated at certain periods of the year by local movements, migrations, an extended spawning season, and the lack of dominant size classes. The problem of fishing intensity has presented innumerable difficulties due to the lack of adequate catch statistics in all of the shrimp-producing States. This problem has been complicated further by the migratory nature of the shrimp and the fishing boats. Tagging experiments are the most feasible approach, so far devised, to the problems of growth, migration, longevity, and fishing intensity. Tagging constitutes a technique that has proven successful in tracing migrations of the South Atlantic shrimp and in providing information on the other questions. All of these problems require solution before a well-founded management of the fishery can be proposed.

Because of extensive offshore fishing and the migratory nature of the shrimp, tagging experiments were first conducted along the Atlantic coast. Now, however, with the establishment of an offshore fishery in the Ship and Trinity Shoals area off central Louisiana, a means is provided for securing the return of tags throughout the year. During the last few weeks of 1938 the ground work was laid for a series of shrimp-tagging experiments in Louisiana waters. Fishermen and dealers throughout the experimental area first were made acquainted with the nature of the investigations to be performed, by means of newspaper articles, talks, and posters. The willing assistance and genuine interest of the industry have contributed to the success of the entire program. The fishermen cooperated by returning captured tagged shrimp and reporting where and when they were taken, and the dealers preserved and retained the specimens and data on their premises until the Bureau's agent could collect them.

The tagging program commenced during mid-December of 1938, when 2,300 shrimp were released in 3 localities between the Mississippi and the Atchafalaya Rivers. During the following month 1,750 additional tagged shrimp were released in the Ship Shoal area. Although these initial plants of approximately 4,000 shrimp were to have been succeeded by regular monthly releases, an unforeseen shortage of funds forced the temporary cessation of the work until the following summer. Tagging was resumed in late August 1939 and continued uninterruptedly for the remainder of the year, and 12,200 shrimp were released during the period. At the same time the area of operations was extended to include inland bays and lakes, as well as offshore waters, and releases were made in Alabama and Mississippi in addition to Louisiana.

Field work has been so extensive that very little time has been available for analysis of the data gathered. Preliminary observations indicate, however, that east of the Mississippi River the shrimp do not confine their movements within State boundary lines. Shrimp tagged in Louisiana were recaptured in Mississippi; Mississippi releases were taken both in Alabama and Louisiana; and Alabama shrimp were returned from both Mississippi and Louisiana waters.

The shrimp tagged and released to date must be regarded as only a beginning of an extensive program. The highly variable characteristics of almost all aspects of shrimp life and behavior make an unusually large amount of data necessary in order to approximate more closely the average. To obtain a complete picture of the movements in the Gulf populations the tagging should be extended to the eastern limit of the fishery, near Carrabelle, Fla., and westward along the Texas coast. The young shrimp inhabiting the inland marsh areas should be marked to follow their growth rate and to determine the factors influencing their egress to the fishing grounds. A considerable number of large spawning shrimp should be permanently branded to determine the possibility of their living more than 1 year, and to follow their spawning movements. The accomplishment of these objectives will require a period of several years and will necessitate the tagging of many thousands of shrimp.

## NORTH PACIFIC AND ALASKA FISHERY INVESTIGATIONS

Dr. Frederick A. Davidson, *in charge*

The North Pacific and Alaska fishery investigations, with headquarters in the Fisheries Biological Laboratory at Seattle, Wash., are concerned with the solution of problems that arise in the maintenance and rehabilitation of the salmon populations of the Columbia River and Puget Sound and the salmon and herring populations of Alaska. All of the major investigations that were in progress in 1938 were continued in 1939.

### COLUMBIA RIVER

The investigation of the biological and physical factors influencing the populations of fish inhabiting the Columbia River and its tributaries was continued during 1939 by J. A. Craig, A. J. Suomela, M. G. Hanavan, Z. E. Parkhurst, R. L. Rucker, and J. R. Coleman.

Since it was necessary to detail practically the entire personnel of this investigation to the fish-salvaging work, it was not possible to conduct any stream surveys during 1939.

*Migratory fish salvage.*—The Grand Coulee irrigation project, now being carried out by the Bureau of Reclamation, U. S. Department of the Interior, makes necessary the erection of Grand Coulee Dam across the Columbia River at a point some 128 miles up-river from Wenatchee, Wash. This structure will be about 330 feet high, from river level to crest, when completed. Because of the great height of the dam, it was decided that it would not be feasible to pass adult migratory fish over the dam on their upstream journey, nor their offspring over the structure in their downstream migration.

Since this situation prevailed, and since significantly important runs of chinook and blueback salmon and steelhead trout normally proceed upstream beyond Grand Coulee Dam, it was necessary to devise and carry out plans for the protection or salvaging of these runs of fish. The method decided upon provided for the trapping of all upstream migrant salmon and steelhead trout at Rock Island Dam near Wenatchee, Wash., and the construction of holding ponds and a large hatchery on the Icicle River, a tributary of the Wenatchee River, near Leavenworth, where the adult fish would be held until the sex products were ripe and the fish were stripped. Subhatcheries, or rearing stations, located on the Methow, Entiat, and Okanogan Rivers are also part of this plan. These stations are to be used for the hatching of the eggs taken from the adults at Leavenworth, after which the young fish will be reared and liberated in the river system where the subhatcheries are to be located. All of these streams enter the Columbia River below Grand Coulee Dam and above Rock Island Dam. Because of the fact that chinook and blueback salmon have an extremely strong and uniform habit or tendency to return to the stream in which they were reared and liberated, it is believed that the fish resulting from the hatchery operations will return to these streams below Grand Coulee Dam, thus making trapping operations unnecessary at some future date.

By the spring of 1939 the construction of Grand Coulee Dam had proceeded to such a point that fish could no longer pass beyond the dam site. Unfortunately, construction of the hatcheries was unavoidably delayed. Therefore, emergency measures had to be taken to accomplish the salvaging of the runs.

It was decided to trap the fish in the fish ladders at Rock Island Dam and to transport them to 3 of the streams entering the Columbia between that place and Grand Coulee Dam, where they were liberated and allowed to spawn naturally. In this way the transfer to the streams below Grand Coulee Dam was begun, but with natural spawning taking the place of the hatcheries.

The permanent trapping equipment at Rock Island Dam was completed last spring and was used to catch the fish in the salvage program. Also, 8 specially built tank trucks, which will be used to transport fish from Rock Island Dam to the Leavenworth hatchery, were used to haul the salmon and steelhead trout to the desired locations. These trucks each have a capacity of 1,000 gallons and are equipped with auxiliary motors, pumps, and compressors which aerate and circulate the water in the tanks. The water is cooled by circulation through ice compartments.

Because of information previously collected by the stream-survey crews, it was possible to select areas in the Wenatchee, Entiat, and Okanogan River systems which were suitable for the spawning activities of the salmon and steelhead trout. Chinook salmon and steelhead trout were placed in Nason Creek, an upper tributary of the Wenatchee River, the main Wenatchee just below Wenatchee Lake, and in the "stillwater section" of the Entiat River. The young of the blueback salmon require a lake for their fresh-water habitat; so that species was planted in Wenatchee and Osoyoos Lakes. Fish weirs, or racks, were constructed at the lower end of each stream section or lake in which the spawners were placed, so that the fish would not stray downstream and perhaps back into the main Columbia where they might be unable to find or reach suitable spawning areas.

The actual hauling of fish began on May 1, and the last load was transported on December 9. All of the salmon in the 1939 run were trapped at Rock Island before hauling ceased, and few, if any, steelhead trout ascend the upper Columbia in the winter. During the May–December period 41,722 fish were hauled. The totals by species are as follows: Chinook salmon, 11,206; blueback salmon, 19,591; silver salmon, 13; steelhead trout, 5,427; squawfish, 1,771; suckers, 3,389; chubs, 133; whitefish, 163; Dolly Varden trout, 1; carp, 2; tench, 1; and lamprey, 25. Every effort was made to sort out the scrap fish, such as suckers, squawfish, etc., so that they would not be hauled along with the salmon. This practice was in general successful, but all of the undesirable species could not be eliminated from the loads.

Careful and complete observations and records were made of the entire salvage operations. The records included the number and species of all fish trapped and hauled each day in each truck, and to each location. The number and species of all fish that died during the hauling or trapping operations were also recorded. Temperature readings of the water in the Columbia River, the tank trucks, and the streams or lakes where plants were made, were obtained. Also, determinations were made of the free carbon dioxide, dissolved oxygen, pH and alkalinity of the Columbia River, the water in the trucks and in the streams where the fish were planted. After the fish were liberated, continuous limnological observations were carried on in the areas where the fish were confined. All dead fish were examined to determine whether or not they had spawned, and aquatic-food samples were taken from the streams. The success of the spawning was recorded and some of the nests were examined to discover the degree of development and the mortality of the eggs. Samples were taken of young steelhead trout from the early spring spawning so that growth could be studied.

The loss of fish during trapping and hauling was extremely small and the mortality in the streams and lakes after the fish were liberated and before they spawned was not excessive, except in the Entiat River where a bacterial fungus infection caused a significant percentage of the spawners to die before they had matured and deposited their eggs.

It is felt that the analysis of these data will contribute significantly to our knowledge of the habits of chinook and blueback salmon and steelhead trout, as well as present a valuable account of a practical fish-salvage operation.

*Tagging.*—Five tagging experiments were conducted near the east end of Sand Island, at the mouth of the Columbia River, on blueback salmon from June 11 to July 9, inclusive. The purpose of these experiments was to obtain data on: (1) The rate of migration of the salmon upstream; (2) their distribution in the river system; and (3) some estimates of fishing mortality.

During the operations 238 blueback salmon were tagged and liberated, of which 61, or 25.6 percent, were recovered from the commercial fishery.

Additional catch records of the commercial fishery were tabulated and summarized to be used in studying the movements and abundance of the salmon populations.

*Construction of fish protective works.*—The program of fish-screen construction in eastern Washington, Idaho, and Oregon was continued under the supervision of J. A. Craig and O. W. Lindgren, and was accomplished with the aid of W. P. A. and P. W. A. funds. During 1939 the construction of the screen in the Wapato Canal, near Yakima, Wash., the work on the Sunnyside screen, and the construction of the screen in the Echo Feed Canal in Oregon, were completed. Both of the canals are property of the U. S. Bureau of Reclamation. Contract work on the screen at the Black Canyon Dam canal of the Bureau of Reclamation, on the Payette River in Idaho, was begun in December and all contract and other work on the screen in the Prosser Power Canal of the same agency, near Prosser, Wash., was almost completed at the end of the year.

### COHO SALMON

The coho salmon of Puget Sound are not only of importance to the commercial fishery of the region, but likewise to the sport fishery which forms one of the Pacific Northwest's most valuable recreational assets. The study of the life history of these salmon, and the causal factors responsible for fluctuations in their abundance, was conducted by George B. Kelez until May 1939. Owing to Mr. Kelez' assignment to the study of the Bristol Bay salmon, Dr. J. L. Wilding, formerly with the Columbia River investigation, took over the study of the coho salmon.

*Marking experiments.*—Final returns from the 1937 marking experiments at the Bureau's Quilcene (Wash.) Hatchery were collected at the hatchery rack in the fall of 1939. During this period the rack was covered twice by flood waters and some of the fish escaped to the upper river. Of 148 adult fish taken at the rack, 67 were marked. Thirty-eight of the recoveries were from the lot of 24,600 fingerlings marked and released in August and September 1937, 25 were from the lot of 20,039 fingerlings marked and released in December 1937, and 4 were from the lot of 17,094 fish marked and released in May 1938. Two additional recoveries from the December 1937 release were made in salt water near the hatchery.

The results of these experiments show that the fall release of fingerlings produced slightly better returns than the midwinter release, with less expense for handling and feeding, and the spring release of fingerlings in their second year produced much smaller returns than did the preceding releases.

Returns from the belly-tagged fingerlings released at the State of Washington's Samish River Hatchery in 1937 [2] also were recovered in the fall of 1939. One adult fish was returned from the October release, 15 were recovered from the December release, and 3 recoveries were made of fish which had not retained the tags. Although these returns were sufficiently large to warrant further experiments, mortality appeared to be considerably higher than that of fish marked by fin incision only. The survival of winter-tagged fingerlings was much greater than that of fall-tagged fish.

*Young fish, and fish-food studies.*—A study of the seasonal fluctuations in numbers of young fish and abundance of the fish-food organisms in the various streams of the region frequented by the coho salmon was begun. This study was also planned to include a correlation of the fish food present with the food organisms consumed by the coho young from the time of hatching until their seaward migration. This procedure, together with a study of the influence of varying environmental conditions on the growth and time of seaward migration of the young, was aimed to give insight into the fresh-water mortality of the species.

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[2] See "Progress in Biological Inquiries, 1937," p. 30.

In order to locate suitable key streams for these studies a general survey was made of the important streams in the region. Five tributaries were selected, each of which differed from the other in its source, distance from salt water, size, shaded areas, type of bottom, mean temperature, and, to some extent, in chemical composition. The selection of streams with varying environmental conditions was made in order to include the important fresh-water habitats frequented by coho salmon.

A new type of sampler for streams, designed by Dr. Davidson and Mr. Kelez, is being used to determine qualitatively and quantitatively the bottom fauna and its variations. The new sampler is more efficient than net types, since it can be used in a variety of locations such as in sand, mud, vegetation, and gravel, and it takes an exact quantitative sample. An example of its efficiency is shown by the numbers of Chironomidae larvae that are consistently taken in the sampler, whereas these forms are usually, if not entirely, missed by other samplers due to the small size of the larvae and their depth in the gravel. Collections of chemical and physical data on the streams, bottom samples, and coho fry or fingerlings are taken each month.

*Hatchery experiments*.—In cooperation with the Division of Fish Culture, a series of experiments are being conducted to test the reactions of coho fry and fingerlings to various concentrations of sea water. The relative tolerance to salt water, and rapidity of adaptation to higher concentrations exhibited by fish of varying age, would have a definite bearing on the time of release of hachery-reared fish. The experiments were begun at the Quilcene Hatchery in November.

## SURVEY OF ALASKAN LAKES

Dr. Wilding was detailed to southeastern Alaska from July to October to study certain lakes and streams in cooperation with the U. S. Forest Service. The purpose of the survey was to determine the physical, chemical, and biological characteristics of the waters in order to formulate a trout-stocking and conservation program. Ten lakes in Southeastern Alaska, and Wonder Lake in McKinley Park, were surveyed. The analysis of the lakes included: Temperature series, dissolved oxygen and free carbon dioxide, pH, carbonates, bottom fauna, fish, and plankton samples. The amount and suitability of spawning area was determined and fish- and egg-planting sites were located. In certain general characteristics the lakes were quite similar, especially in regard to their oligotrophic nature, high oxygen content, low bacterial decomposition and carbon-dioxide content, slightly acid reaction, absence of vegetation, and scarcity of bottom organisms. The plankton population was extremely variable from lake to lake, and in general there were numerous organisms of a few species. A detailed report of the investigation has been prepared and a stocking policy recommended.

## BRISTOL BAY SALMON FISHERIES

The Bristol Bay area, which produces more than 60 percent of the pack of red salmon in Alaska, is one of the greatest salmon-producing districts in the world. During 1939 this area produced 54½ million pounds of canned salmon. This pack was 5 million pounds below the average for the preceding 10 years, the curtailment being due, in part, to a shortening of the fishing season by the Bureau in order to insure the escapement of an adequate number of spawning fish to the tributaries in the various watersheds.

The determination of the causal factors affecting the fluctuation in abundance of the salmon runs in this region is the fundamental purpose of the investigation being conducted by Mr. Kelez and Joseph T. Barnaby, assisted by Walter Sands, Albert Collier, and Robert Hacker. The problems entailed in the investigation are manifold, including a complete study of the life history of all the races of salmon populating the lakes and rivers in a watershed of over 35,000 square miles. In addition to the studies on the fresh-water phase of the life history of the red salmon, studies must be made of the factors that influence the growth, mortality, and migrations of these fish during their sojourn in the ocean.

*Fresh-water studies.*—Investigations of the fresh-water phase of the life history of the red salmon of the Bristol Bay region were carried on during the season of 1939 at field camps established on 5 of the main rivers during the summer, and on the watersheds of these streams during the fall. A camp at the foot of the Naknek River rapids was established on May 19; 1 at the head of the Ugashik River lagoon on May 24; 1 on the Kvichak River, at the foot of Kaskonak flats, on May 25; 1 below the Egegik River rapids on May 27; and 1 on the Wood River at the foot of Marsh Mountain on May 31.

Regular samples of seaward migrant fingerlings were taken at each camp, collections of other fishes were made, and fingerlings were marked for future identification in the rivers where they were available in sufficient numbers. Daily records of weather conditions, stream levels, and air and water temperatures were kept throughout the season until the parties moved to the upper watersheds for spawning observations. The stream observations will be correlated with annual meteorological data collected by the U. S. Weather Bureau at 3 stations in the Bristol Bay region.

The spring break-up was very late in 1939, particularly in the Wood River watershed, where ice, carried down from the Wood River lakes, seriously interfered with seining activities as late as June 13. Fingerlings were available in sufficient quantities to warrant marking only in the Naknek and Wood Rivers, although small numbers of migrants were taken in the other streams.

Migrants were taken in the Naknek River from May 31 to August 15, but less than 100 per day were caught prior to June 14. Marking, by excision of the dorsal and right ventral fins, was begun on June 16 and terminated on August 14. All marked fish were retained in holding pens for 24 hours after marking in order that the losses due to handling might be determined. The total release of marked fish in this area was 26,419. The Naknek fingerlings were large, averaging about 113 mm. in length, and were in good condition; losses due to handling were small. The recovery of these marked fish as adults will afford data on life history, points of capture in the commercial fishery, and mortality in the ocean.

Fingerlings were taken in the Wood River from June 4 to August 22, and marking was carried on between July 3 and August 14. Abnormal water levels in the river during the month of June followed the late break-up of ice on the Wood River lakes. A peak rise of more than 45 inches during this period reduced the number of locations suitable for fishing activities appreciably. The water level dropped gradually thereafter throughout the season, a condition exactly opposite to the normal occurrence in the Bristol Bay streams. The total release in this area was 11,338 fingerlings, marked by the excision of the adipose and left ventral fins. The Wood River fingerlings were much smaller than those of the Naknek area, their general condition was poor, and they were further weakened by a high degree of infestation by cestodes. Losses due to handling aggregated nearly 20 percent of the fish taken; an exceptionally high mortality for wild fish.

During the commercial-fishing season 1 man was stationed at each of the main rivers to obtain regular scale samples, body measurements, weights, and sex proportions from the catches of the commercial drift-net fishery. Additional samples were taken from the fish caught by set nets within the rivers. These data will provide information concerning the age of the mature fish, material for racial comparisons, and a basis for the determination of gear selectivity.

The field parties were moved to the tributaries of the respective rivers during August for the purpose of making surveys of spawning grounds. In the course of the surveys, actual numbers of spawners were counted in various streams and their tributaries. The rate of water flow, temperatures, stream-bed characteristics, and the extent of the spawning areas were determined. Body measurements, scale samples, and data on various morphological characters were obtained from spawners in these areas for racial comparisons. Of the spawning tributaries thus investigated, 3 were rivers, 7 were major streams, and 19 were creeks. The field parties returned to Seattle via the Iliamna Lake portage on September 6.

In addition to the above-mentioned activities, several lakes were surveyed by Mr. Kelez as possible sites for survival studies on eggs and young fish. All major spawning areas were covered at least twice during the season by aerial survey, and spawning-ground estimates thus made were correlated with the work of the field parties. A new method of making a population census by means of aerial photographs was begun. While still in the experimental stage, this method holds much promise in that it makes possible a determination of the distribution of spawners in inaccessible areas, or in those areas where the cost of ground surveys is prohibitive.

For Bristol Bay in general, the escapement of 1939 was considerably less than that of 1938, the Kvichak area showing the greatest proportional decrease. The Naknek and Egegik areas indicated uneven distributions and decreased total numbers of spawners, while the Wood River and Nushagak escapements were more nearly equal to those of 1938. The Ugashik area had a somewhat better escapement than that of 1938, although the spawning ground in this district was still not adequately seeded.

*Marine studies.*—Investigation of the marine phase of the life history of the Bristol Bay populations is not only important in order to determine the factors influencing the salmon growth and survival, but is also of imporance in ascertaining the magnitude of the commercial catch, since part of the run of fish is captured 400 to 500 miles from the home streams of the salmon.

Tagging experiments were carried on in the Shumagin Island area and in the Ikatan-Morzhovoi Bay area to determine the migration routes and destinations of the salmon frequenting those areas. In these experiments, mature salmon on their spawning migration were tagged by means of an aluminum strap-tag which was attached to the dorsal part of the caudal fin. The experiments were similar in nature to those carried on in 1923 by Charles H. Gilbert and Willis H. Rich.[3]

A greater return was obtained from the 1939 Shumagin Island tagging than was obtained in 1923, the recovery being 34.5 percent as against 28.7 percent in 1923. A much higher percentage of the fish was caught locally, 22.6 percent in 1939, compared with 2.6 percent in 1923. A greater percentage of returns was taken to the eastward, 4.3 percent in 1939, and 0.5 percent in 1923. Most of the returns came from Chignik, which experienced a good run during the past season. Lower percentages were recovered from Ikatan and Bristol Bays in 1939, 3.0, and 1.2 percent, compared to 11.1, and 9.2 percent, respectively, in 1923.

The 1939 study of the migration of fish around the Shumagin Islands supports the conclusion that as many fish traveled up Popoff Straits as migrated down the Straits. The results, therefore, do not confirm the conclusion made by Gilbert and Rich on the basis of the 1923 study that "the majority of the salmon that escape the traps in the region of Kelly Rock skirt the south shore of Unga Island * * *."

The return from the Ikatan tagging experiments was 37.0 percent in 1939 as against 44.6 percent in 1923. Fewer fish were recaptured locally in 1939; 19.7 instead of 34.0 percent. A slightly higher percentage migrated eastward; 1.0 compared to 0.3 percent in 1923. A smaller number was taken in Bristol Bay; 4.0 percent in 1939 and 6.2 percent in 1923. The lower percentage of recovery in the Bristol Bay area was due in part to the fishery on the south side of Unimak Island, which recaptured 10.8 percent of the fish tagged, whereas in 1923, this fishery was not in existence and consequently once the fish left Ikatan Bay they were not intercepted until they reached Bristol Bay. Of special interest is the evidence indicating that at least a fair proportion, if not a majority, of the Bristol Bay fish which pass the Shumagin Islands and Ikatan Bay proceed to Bristol Bay along the south shore of Unimak Island, and thence probably through Unimak Pass. Gilbert and Rich (loc. cit.) concluded that most, if not all, of the Bristol Bay fish found in the Shumagin Island and Ikatan Bay area proceeded through False Pass on the way to their home streams. Although those authors pointed out that fish may enter Bering Sea through other passes, they also stated that "no such migration through western channels has ever been reported."

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[3] Second experiment in tagging salmon in the Alaskan Peninsula Fisheries Reservation, summer of 1923, by Charles H. Gilbert and Willis H. Rich, Bulletin, U. S. Bureau of Fisheries, vol. 42, 1926, pp. 27–75.

In the 1939 experiments a smaller return was made locally from the tagging at East Anchor Cove than was made from the tagging close to False Pass, indicating that in general the fish were moving away from the Pass. The relatively high percentage of marked fish recovered south of Unimak Island, and the abundance of migrating red salmon along this entire shore, shows that a fairly large number of fish travel by this route after leaving Ikatan Bay. These fish would enter Bristol Bay via Unimak Pass or other passes to the westward.

Local fishermen who have tried to catch fish in False Pass report that there are no red salmon to be found in the northern half of the Pass, and that while red salmon enter False Pass they do not go through but return to Ikatan Bay. While it is possible that some red salmon do go through False Pass, it is certain that a fairly large number proceed from Ikatan Bay to Bristol Bay via Unimak Pass and other passes to the westward.

A study of the migration routes of the Bristol Bay red salmon populations was also made in the off-shore waters, both north and south of the Alaska Peninsula, by operating various types of fishing gear at varying distances from shore. The data obtained from this research are of considerable value in determining the areas traversed by the salmon on their return to their home streams, and also the types of organisms taken by them for food.

The U. S. Coast Guard again cooperated with the Bureau of Fisheries by furnishing the cutter *Redwing* for the purpose of conducting the oceanographic survey of Bristol Bay and contiguous waters. New anchor gear and a sonic depthfinder were installed on the *Redwing* early in the spring to facilitate the carrying on of the oceanographic studies, which require numerous stops for samples and for frequent and accurate soundings.

Samples were obtained at all stations in Bristol Bay proper prior to the time of the fish run, during the run, and again after the run has passed by. In addition, some samples were taken between Unalaska Island and the Pribilof Islands. Temperature data and plankton samples were collected, and chemical analyses were made of the water taken at various depths from each station, to determine the oxygen, chloride, silicate, phosphate, and nitrite content of the water. The purpose of the oceanographic surveys is to determine the environmental conditions in the areas in which the fish spend a part or all of their sojourn in the ocean.

## KARLUK RIVER RED SALMON

Further studies to determine the extent and causes of the fluctuations in the size of the red-salmon runs to the Karluk River, Alaska, were conducted in 1939 by Allan C. DeLacy and William M. Morton. The period of field work extended from May 1 to October 5, and the tabulation and analysis of data occupied the balance of the year.

The runs of red salmon to the Karluk River have shown great fluctuations in abundance during the 19-year period in which they have been under observation by the Bureau of Fisheries. From 1887 to 1908 the commercial catch of red salmon in the Karluk area averaged 2,500,000 fish per year. Following this period, the commercial catch has exceeded 2,000,000 fish in only 1916, 1917, and

1926. With the establishment of a counting weir in the river in 1921, and the passing of the White Law in 1924 (43 Stat. 464), a 50 percent escapement of fish to the river has been required. This limited escapement has curtailed the commercial catch in the area, and since 1924 the total run of red salmon to Karluk has exceeded 2,000,000 fish in only 8 years; in only 2 of these 8 years did the total run exceed 3.000.000 fish.

In view of the decline in the productivity of the Karluk River every effort is being made to determine its cause, with special emphasis on the factors responsible for the mortality of red salmon during their fresh-water and marine existence. Because of the greatly varying environmental conditions in the river system, it has been found that the number of mature salmon necessary to adequately seed the spawning grounds may fluctuate considerably from year to year. The mortality of the salmon during their fresh-water existence has been traced to the influence of environmental conditions on the spawning grounds and to seasonal fluctuations and periodic trends in the fertility of the lake, which are responsible for corresponding variations in the abundance of the food available to the young fish and the influence of fresh-water predators.

An intensive study has been made of the mortality of the red salmon during their marine existence by means of consecutive yearly marking experiments from 1926 to 1936, inclusive. The results of this study indicate that there is a fairly constant mortality of the salmon in the ocean which averaged 79 percent during the 8-year period of study.

A complete report of the activities and results of this investigation of the Karluk red salmon, from 1926 to 1936, has been prepared by J. T. Barnaby and submitted for publication. Mr. Barnaby conducted this investigation from 1929 to 1938 and then was transferred to the Bristol Bay investigation.

*Migration studies.*—Red-salmon fingerlings migrating to the ocean were first seen in abundance at the Karluk weir on June 1. The migration continued for about 2 weeks and appeared to be normal in size. Samples of the fingerlings were taken to determine the age composition of the migrant run, and the average length of the individuals in each age group. The 1939 migrants were of average size and were considerably larger than the 1937 and 1938 migrants.

Between May 21 and September 23, 666,004 adult red salmon were counted as they passed through the weir, and it was estimated that after the removal of the weir on September 23, 40,000 additional red salmon ascended the river. Only twice before, over a period of 19 years, has the escapement been less than in 1939. However, conditions on the spawning grounds appeared to be favorable, and a fair to good return is anticipated, despite the relatively small size of the escapement.

The number of pink salmon passing through the Karluk weir was 31,944. This is the largest odd-year escapement of pink salmon since 1933, and it is evident that the 2-week cessation of commercial fishing in the Karluk area, between July 24 and August 5, was beneficial.

*Racial study.*—It has long been recognized that the run of adult red salmon to the Karluk River is characteristically divided into 2 parts. The first peak of abundance occurs in June, and the second in August or September. If the fish that constitute these 2 runs are hereditarily distinct, then it is apparent that conservation measures must be designed and carried out in such a manner that each group will receive adequate protection. To ascertain whether or not the two runs are racially distinct, morphometric data were collected from 448 red salmon during the 1939 season between June 7 and September 16. Twenty-one measurements were made on each fish examined, and in addition the gillrakers were counted. A statistical treatment of the data will reveal any dissimilarities between the two runs of Karluk fish. A large sample of pink salmon also was measured for racial characteristics to be included in the racial studies of the pink salmon in Alaska.

*Egg counts.*—Counts were made of eggs collected in 1938 from 60 red salmon that ranged from 51 to 65 centimeters in length. The left ovary was found to contain a higher average number of eggs than the right ovary, although in similar counts made in 1926 the reverse of this condition usually was found. The 1926 sample of fish averaged 3,728 eggs per individual. The 1938 average for a comparable group of fish was 3,218. In general, the larger the fish the greater was the discrepancy between the results of the 2 years' tabulations. One hundred and twenty additional egg samples were collected during the 1939 season and will be used to supplement the 1938 data, and to determine whether or not the number of eggs per female varies from year to year.

### DOLLY VARDEN TROUT

Life-history studies were continued at Karluk in 1939 on the salmon predator *Salvelinus malma*, commonly known as the Dolly Varden trout, or char. From tagging experiments started in 1937 and 1938 a total of 875 tags were recovered. Two tagging and three marking experiments were initiated in 1939. During the upstream migration of Dolly Varden trout in July, 2,695 fish were tagged at the Karluk weir, and at a weir built in Thumb River—the largest tributary of Karluk Lake—1,463 additional chars were tagged in late summer. One marking experiment was made at the Karluk weir in which the adipose and both ventral fins were amputated from 2,038 Dolly Varden trout between 21 and 25 cm. in length. At the Thumb River weir the adipose and left ventral fin were clipped from 543 fish between 16 and 20 cm. long, and the adipose and right ventral from 178 chars between 11 and 15 cm. in length. Returns from these marking experiments will supply data concerning the growth rate and migration of a group of small fish which it is difficult to tag successfully.

The conclusion that there are at least 2 populations of char in the Karluk system was reached after the tag recoveries made in 1937 and 1938 had been analyzed. The presence of a nonmigratory lake population and a population which annually migrates to and from the ocean was shown. In 1939 additional tag returns and a study of the morphological characters of the Karluk chars confirmed the foregoing conclusion. The total number of gillrakers proved to be a useful diagnostic character. The stationary, or lake-type char was found to have an average of 23.4 (21 to 26) gillrakers, while in the migratory, or ocean-type char the average number of gillrakers was 18.4 (17 to 21). Some of the other characters which differ in the 2 types are the coloration, average number of vertebrae, length of head, diameter of eye, and depth of caudal peduncle.

Returns in 1939 from 2 tagging experiments in progress at Karluk Lake again pointed to the lack of homogeneity in the lake's char population. Fish tagged in 1937 were still most commonly found in 1939 at the mouths of the same streams at which they had been tagged 2 years earlier. Further study will be required to determine the presence or absence of races of chars within the lake itself.

### PINK SALMON

The study of the causal factors responsible for the fluctuations in the abundance and seasonal time of the spawning migration of the pink salmon in Alaska was continued during 1939 by Dr. Davidson and S. J. Hutchinson.

The pink salmon are by far the most abundant species of Pacific salmon in Alaska. During the past 10 years an annual average of 3,150,748 cases of pink salmon have been packed, whereas the red salmon, which are second in abundance, have yielded an average of only 1,908,072 cases yearly. The pink salmon have a lower market value than the red salmon. The 1930–39 annual average catch of pink salmon was valued at $13,346,874, while the corresponding average value of red salmon was $15,798,340.

Because of the complete 2-year life cycle of the pink salmon it is possible to build up or break down a population of the species within a few years. The record packs of pink salmon from 1934 to 1938 have been due in part to the successful reproduction of the species, and in part to the increase in the intensity of the fishery. The size of the spawning populations in 1937 and 1938, in some areas, was far from comparable to the total catches of the fishery, and a marked reduction in the ensuing populations was predicted. The unusually small packs of pink salmon in 1939 in Central Alaska, with the exception of the Kodiak and Cook Inlet areas, and in Southeastern Alaska, were to be expected. In Southeastern Alaska the intensity of the fishery has been mounting in spite of warnings from the Bureau of poor escapements and unfavorable spawning conditions. A number of needed restrictive regulations were recommended for the pink-salmon fishery in the Central and Southeastern sections for 1940. In view of the almost complete lack of escapement in some areas in the Southeastern section in 1939, an extensive curtailment of the fishery will be imperative in 1941 if the populations in these areas are to be kept above the critical point of depletion.

One of the most important factors in the reproduction of the pink salmon is the mortality that occurs during their fresh-water existence. The stream at Little Port Walter, on Baranof Island in Southeastern Alaska, was selected as a site where fluctuations in the fresh-water survival of the pink salmon could be determined and the causes thereof studied. In March and April, 1939, a combination stop-log dam and counting weir was constructed in the stream at Little Port Walter which will permit the counting of both the upstream and downstream pink salmon migrants. The counts will make possible the determination of the number of fry resulting from the spawning of a known number of eggs each season. The adults returning from the liberation of a known number of fry each season will be determined from the subsequent spawning populations, and in this way the percentage of mortality during both the fresh-water and salt-water existence may be calculated.

In order to carry on the necessary weekly observations of the influence of environmental conditions on the brood in the stream, and conduct laboratory experiments on the salmon leading to a better understanding of their reactions to certain environmental factors, a laboratory-residence building was constructed at Little Port Walter during the past summer. A permanent biological station foreman will be appointed for the purpose of maintaining the equipment at the station and making the necessary biological observations regarding the survival of the salmon in the stream. It is expected that the results from the continuous operation of this field station will give insight into the survival of the pink-salmon brood in this region of Alaska each year, and permit more accurate predictions as to the size of the annual runs of pink salmon.

*Spawning escapement.*—The first count of adult salmon through the weir at Little Port Walter in 1939 was made on August 17, and by August 22 the run was well under way. A total of 16,830 pink, 122 coho, 117 chum, and 7 red salmon was counted through the weir. Of the 16,830 pink salmon, 51.56 percent were males, and 48.44 percent were females. The pink-salmon escapements through the weir at Little Port Walter prior to 1939 were: 1934, 6,952; 1935, 6,073; 1936, 5,164; 1937, 7,085; and 1938, 6,467. The adults in 1939 came from the spawning population of 1937, and, since the commercial fishery at Little Port Walter has been negligible, this is the first year when the returns were greater than 1¼ to 1. Unfortunately, it cannot be determined whether this survival occurred in the salt-water or fresh-water period, but such fluctuations in the future, it is hoped, may be traced to the influence of certain environmental factors.

*Tagging program.*—With the opening of the commercial fishing season in Eastern District on July 5, a pink-salmon tagging program was instigated. Pink salmon were tagged and released each week end throughout the fishing season. All the tagging was conducted from the 2 traps in Tebenkof Bay, which are the first traps encountered by the migrating salmon as they enter Chatham Straits from the south and travel the inside waters to their spawning grounds in Frederick Sound and contiguous waters. A total of 2,100 pink salmon were tagged during the season. The general trend of the migration, as indicated by tag recoveries, is northeast into the inside waters of Frederick Sound, Stephens Passage, and the Stikine River region. There were 684 tags recovered, yielding a 32.57 percent return from the experiment. Of this number of recaptures, the majority traveled a distance of 40 miles or more and were taken within 5 days after the tagging date. The greatest distance that a tagged salmon traveled before being recaptured was 162 miles. One specimen, taken the day after tagging, had traveled over 100 miles. Thus it becomes evident that the pink salmon entering Lower Chatham

Straits are not destined to any one particular locality, but are quite diversified in their routes of migration. Tagged pink salmon were recaptured in 26 different salmon traps in Western District, in 36 salmon traps in Eastern District, in 16 traps in Sumner Strait District, and in 1 trap in Clarence Strait District. Seine boats reported captures in 19 localities, and gill nets in one location. Of the total of 684 recaptures, 551 were made by traps, 128 by seine boats, 2 by gill nets, 2 from streams, and 1 unknown. The traps caught 80 percent of the tagged salmon that were recaptured, the seine boats 19 percent, and 1 percent was taken by miscellaneous gear.

*Racial study.*—A racial analysis of the pink salmon in Southeastern Alaska is being made. The first step in the analysis is to determine from body measurements suitable indices for comparing the populations, i. e., ratios of measurements that are characteristic of each population. At present, 15 ratios have been devised and are being tested to determine their reliability as racial indices. After these racial indices are determined, the experiment will reduce to the comparison of populations from various localities using these indices and thus determine the races of pink salmon existing in Southeastern Alaska.

## ALASKA SALMON STATISTICS

The collection, tabulation, and analysis of the daily catch records from the various types of fishing gear operated by the salmon fishery in Alaska was continued in 1939 by Elizabeth Vaughan. The purpose of this investigation is to provide a permanent source of information from the daily catch records of the various forms of gear from each of the geographical divisions of the territory. These records provide an invaluable part of any investigation of the fisheries, and will make possible a complete survey of the industry year by year. The single comprehensive compilation will avoid duplication of effort which would inevitably result from the individual collection of statistical data by several investigators, and will insure the collection of much valuable data which would almost certainly be lost with the passage of time and changes in the companies operating, were the collection delayed until further investigation was undertaken. To eliminate duplications and losses, the statistical investigation was originated with the following specific aims: (1) To collect all available records of the daily catch of salmon in Alaska from each form of gear; (2) to add to those early records the current data as it becomes available each year; (3) to index carefully and segregate the data by area, species, and type of gear; and (4), to tabulate the data into usable form, and to analyze these tabulations as may be required in the study of specific problems.

During the past years, all available records have been collected. The analysis of the trap-catch records for the Southeastern Alaska and Prince William Sound fishing districts have been made for the pink and chum salmon.

During 1939 the data on the 1938 fishing season were collected, and the analysis of the trap-catch records of the pink and chum salmon for the Southeastern Alaska and Prince William Sound districts was added to the analyses for previous years. The analysis consists of determining the average daily catch per trap for each fishing season, by district. Indices of abundance and seasonal time of appearance of the salmon runs are determined from these daily averages. This information is used as a basis for recommending changes in the fishing regulations in Alaska in order to provide for the conservation of the salmon resources.

During 1939 the records from the Alaska Peninsula, Chignik, Kodiak Island, and Cook Inlet trap fisheries were sorted and indexed. The tabulation of these data will be begun in the near future.

### HERRING

Three major areas of the Territory of Alaska at present support extensive commercial herring-fishery operations; these being Kodiak, Prince William Sound, and Southeastern Alaska. The investigation of the herring fisheries, which was continued throughout the year by E. H. Dahlgren and L. Kolloen, was primarily concerned with the following problems: The delimiting of the areas frequented by the various races or populations comprising the stocks of herring; an evaluation of the abundance of the populations supporting each of these fisheries; the measuring of changes in fishing intensity; and the determination of fluctuations in annual increments to the population, and the factors governing these fluctuations.

*Kodiak area.*—In the Kodiak area the largest catch ever recorded was made in 1939, with a total take of 309,000 barrels. However, the total catch of itself has no significance as a measure of abundance unless correlated with the fishing effort required to make it. Since the inception of reduction operations in this area in 1935, the herring fishery has undergone a tremendous expansion. Reduction capacity has increased from 15 tons of raw fish per hour in 1935, to 45 tons per hour in 1939; the number of vessels engaged has increased from 11 to 21; and, with a tendency toward the use of larger vessels, the fishing capacity of the fleet has increased threefold. In order to establish a trend of abundance, the number of vessels, weighted by their net tonnage in order to account for the greater efficiency of larger vessels, multiplied by the number of days each vessel operated in the area, was divided into the total catch for the year to give the average catch per ton-day of fishing effort. These data were compiled for each year since the inception of the reduction industry in 1935. The catch in barrels per ton-day fished rose from 6.4 in 1936 to a high of 7.5 in 1937 and has declined to a low of 4.5 in 1939.

The great abundance of herring in the Kodiak region during the past 5 years has been in part the result of the accumulations of the stocks during the less intensive operations previous to 1935. A further factor that contributed to the high abundance level has been the presence in the catch of the offspring of the dominant 1931 year-class. The phenomenon of dominance of certain year-classes, with the attendant great natural fluctuations in abundance, results from an occasional remarkably successful spawning, in consequence of which large numbers of larvae survive to enter the adult populations 3 years later. In contrast, spawnings in immediately previous or subsequent years are not so successful—some may even be virtual failures and contribute no appreciable increments to the stocks. Daily samples of the catch were taken throughout the season and ages were read from the annuli on the scales, in order to establish the relative abundance of the various age groups represented in the catch in relation to comparable data obtained in previous years.

In 1937, the first year for which adequate data are available for the Kodiak region, the 1931 year-class constituted 70 percent of the total number of fish taken. In 1938, with the entrance of the 1935 year-class into the catch, the year-class of 1931 declined to 49 percent of the total yield. Age readings of approximately 2,500 individuals during the 1939 season revealed that the catch was still composed of 20 percent of the 1931 year-class even after 5 years of fishing had decimated its numbers, and also confirmed the previous findings that the spawnings of 1932, 1933, and 1934 failed to contribute any appreciable increment to the stocks. Since the spawnings of these years added so little to the populations, and since the 1931 year-class will have been nearly exhausted by 1940, the catch during that season will become dependent almost entirely on fish spawned in 1935 and 1936. This condition does not bode well for the continuance of a high abundance level. In view of the increased fishing intensity, the declining return per unit of gear, and the decreased spread of the age composition of the stock, the need for close supervision of the herring fishery cannot be disregarded.

*Prince William Sound area.*—The catch in the Prince William Sound area during the 1939 season was 423,000 barrels. This total compares favorably with the average catch of 317,000 barrels during the preceding 5 years, and taken alone would indicate a healthy condition for this fishery. Considered, however, in relation to the amount of fishing effort required, and the declining return per unit of gear, together with the change in age composition, it is apparent that this area, too, will require careful supervision to avoid overexploitation.

Reduction capacity in this area has increased from 7 tons of raw fish per hour in 1934, to 66 tons per hour in 1939 and this increase in plant capacity has been followed by an increase in fishing effort. The number of vessels employed in 1934 was 7, compared to 30 in 1939. Because of the larger vessels employed, the increase in actual capacity was in the ratio of 6 to 1. In the face of this increase in the fishing effort the catch per unit of gear, based on the catch per ton-day of fishing effort, as in the Kodiak area, has shown a progressive decline from 8.1 barrels in 1934 to 3.1 barrels in 1939.

Reduction operations in the Prince William Sound area were not intensive until after 1934, providing an opportunity for the herring stocks to build to a high abundance level. This abundance also was bolstered by the presence of a dominant 1931 year-class, as occurred in the Kodiak area. The 1937 and 1938 samples of the catch in this area were taken in the fall months only—August 25 through September. In 1939, for the first time, age-composition data are available throughout the season, and age determinations from scales of approximately 4,600 fish were made. However, since there is a change in the age composition of the catch during the season in this area, with the older fish appearing in greater relative abundance during the fall months, comparisons of the age composition of the catch with that of previous seasons has been made for the fall portion of the season only. This analysis shows that the

1931 year-class represented 54 percent of the catch in 1937, 48 percent in 1938, and 32 percent for the corresponding period in 1939. Here, again, the spawnings of 1932, 1933, and 1934 were almost total failures, their combined contribution to the catch during the fall of 1939 being less than 5 percent. With the disappearance of this dominant 1931 year-class, and because the succeeding 3 brood-years failed to contribute any measurable portion to the catch, a further decline in the population level may be anticipated in this area for the 1940 season.

*Southeastern Alaska.*—The season's catch for Southeastern Alaska in 1939 was 160,000 barrels, compared to a 10-year average of 434,000 barrels in the area, and was the lowest catch recorded since the inception of the intensive reduction fishery 15 years ago. The success or failure of this fishery has been dependent almost wholly on the abundance and availability of the stock of herring frequenting the Cape Ommaney area. The continuing decline in the abundance of this population, as reflected in a declining catch per unit of gear, led to a closure of the Cape Ommaney area during the 1939 season, although nearly 72,000 barrels of the total catch were taken from this same population outside of the closed area.

Samples of the size and age composition of the catch in this area were again collected. In the Cape Ommaney region, as in Kodiak and Prince William Sound, the 1931 year-class dominated the catch for several years, but by 1938, due to the more intensive fishing in this area, had practically disappeared. Here, too, the spawnings of 1932, 1933, and 1934 were virtual failures. The decline in this fishery to a dangerously low level must be attributed, in no small measure, to this failure of the young to survive.

A survey of the spawning grounds at Sitka, which is the source of the Cape Ommaney stock of herring, was made during the spring of 1939. For the second consecutive year the run in this important area was exceedingly light, giving further proof that the decline in abundance as measured by the catch per unit of gear is valid. Incidental to this survey, an effort was made to determine the effect of temperature and dessication on the survival of eggs spawned in the intertidal zone. The clusters of eggs could not be separated for microscopic examination without hardening them in a fixative. When the eggs were hardened they became opaque which precluded a determination of viability. Thus the attempt resulted only in the development of a technique for hardening, separating, and clearing eggs which will make possible future accurate estimates of mortality due to temperature and dessication.

## PACIFIC PILCHARD INVESTIGATIONS

O. E. Sette, *in charge*

The problem of the pilchard investigation is to determine the amount that can be safely harvested annually without jeopardizing future yields.[4] This determination is complicated by the existence of natural fluctuations in abundance, which are caused by differences from year to year in the numbers of fish surviving the early stages of life. There are also variations in availability, so that the commercial fishery probably reflects fluctuations in abundance more or less imperfectly, depending on whether fishing conditions are favorable or unfavorable. For these reasons the recognition of an irreversible decline in abundance is not easy, but requires evidence on many aspects of the fish and the fishery.

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[4] Progress in Biological Inquiries, 1938, pp. 43–47.

During the season of 1938–39 the exploitation of the fishery was modified by withdrawal, in midseason, of floating reduction plants from high-seas operation. This action was the result of economic difficulties during the early part of the season and of the previous year, and coincided with the passage, by referendum, of an amendment to the State Constitution giving the California State Fish and Game Commission authority to prevent deliveries by California fishing boats to establishments outside of the jurisdiction of that State.

The season's catch was as follows: California, 574.676 tons; Oregon, 17.018 tons; Washington, 26,483 tons; British Columbia, 52,049 tons; a grand total of 670.226 tons. Of this quantity, 44,000 tons were caught for floating reduction plants operating on the high seas off San Francisco.

The total was more than 37.3 percent higher than that of the previous season. This increase probably may be ascribed to a natural fluctuation in abundance brought about by the entrance into the fishery of unusually successful year-classes produced some years previously; probably in 1934 to 1936. This probability is suggested by the higher percentage of young fish in the catch. It is difficult to determine, however, from present evidence, whether the increase is due altogether to these incoming year-classes, or partly to a better availability than obtained the previous season. An apparent dearth of older fish also raises the question as to the possible existence of a fundamental decline obscured by the accession of so many young.

The program of work discussed herein was carried out by a staff consisting of O. E. Sette, who was in charge of the investigation, Dr. L. A. Walford, Kenneth Mosher, Ralph Silliman, Earle Palmer, and Robert Luckhardt. The broad scope of the investigation and its accomplishments were possible only because of the cooperation and assistance of several organizations and persons. Clerical and technical assistance were furnished by W. P. A. Projects 702–3–1 and 10917; thus, 10,000 scales and a like number of otoliths were mounted, 550 bottles of plankton were sorted, and extensive statistical processes were carried on which would not otherwise have been possible. The extensive plankton research was made possible by the cooperation and collaboration of the Scripps Institution of Oceanography and its director, Dr. H. U. Sverdrup. Subsequent studies on hydrographic data carried on by Mr. Richard Tibby, of that institution, were made available immediately to the Bureau for its biological studies of the young pilchard. The California State Fisheries Laboratory, the Fish Commission of Oregon, the Department of Fisheries of Washington, and the Fishery Research Board of Canada all contributed records essential to various phases of the Bureau work of 1938–39. Stanford University contributed laboratories for the central office, and also provided facilities in Hopkins Marine Station for the Bureau field man stationed at Monterey. Members of the faculty of Stanford University, notably Drs. Frank W. Weymouth and Willis H. Rich, contributed advice on matters pertaining to the Bureau program.

## STUDIES OF ABUNDANCE

According to a study of the catches of a fleet of purse seiners which were delivered primarily to reduction ships on the high seas off the coast of central California, the abundance of pilchards in that area has undergone a fluctuation; increasing slightly less than twofold from the season of 1932–33 to that of 1934–35. During the succeeding 3 seasons it decreased by about 70 percent, and in the last year, 1938-39, it increased again by about 15 percent.

An essentially similar course has been demonstrated by the study conducted by the California State Fisheries Laboratory on the shore landings at the ports of Monterey and San Pedro. Therefore, it was evidently a condition effective generally in the waters off California. Obviously, the initial rise during this period was due to the entrance of a successful year-class, or group of year-classes, probably 2 in number, produced in the spawning seasons of 1930 and 1931. The subsequent downward trend in the curve, a matter of 30 percent per annum, represents the decline of a population dominated by these 2 year-classes, to which there were no important new accessions. By itself, 30 percent per annum has little significance, but must be compared either with a previous or a future cycle of the passage of a successful year-class or group of year-classes through the fishery. Unfortunately, the manner of regulating the fishery in previous years, enforced in part by the State and in part by the industry, makes it difficult to obtain a parallel statistic for previous comparable cycles. However, judging from the high percentage of the young, coupled with the large catch of the current season, it appears that a new cycle has now begun and will soon afford the desired comparison.

In Washington and Oregon the fishery for pilchards has a history too short to cover the same period as that studied for California. The available records, as analyzed by Vernon E. Brock, of the Oregon Fish Commission, in collaboration with O. E. Sette, pertaining to the summers of 1935 to 1938, inclusive, did not show a decline similar to that noted from the California records, but rather an oscillation about the horizontal trend; the years 1935 and 1937 being high, and the years 1936 and 1938 being low. This is a somewhat surprising result in view of the finding by both British Columbia and California investigators that pilchard migrate between California and British Columbia waters. Hence, fluctuations should be similar, even at these extremes of the range, provided the entire population migrates. The only inference to be drawn from the lack of similarity in the results from the north and south is either that a varying proportion of pilchard migrates to northern waters each summer, or that availability in the north fluctuates so strongly that the commercial fishery cannot reflect changes in general abundance. A longer series of observations must be awaited before conclusions on these points can be reached.

## AGE AND GROWTH

The identification of year-classes, and the measurement of their relative strength, involves a knowledge of past survival rates of young fish, which can become known by determining the age of fish surviving to commercial size. Though an approximate knowledge of age and growth has been attained through a study of the size composition of the commercial catch, a greater precision is necessary for determining the relative numbers of each year-class surviving from year to year; and, also, the relative mortality rates, once the fish attain commercial size. Such precision is possible by determining the age composition of the commercial catch. Age determination is a technically difficult task, having been first attempted some 14 years ago, and, up to the time of this investigation, not yet accomplished. By intensive experiments during the past 2 years it has been found that the age of juvenile pilchards, i. e., those up through the third year of life, can be determined by rings formed annually on the scales and also on the otoliths. It was found that in California, fish of the year among the samples studied in 1938 had a modal body (standard) length of about 70 mm. (total length of about 3.3 in.) in June, when they first appeared in the bait fishery, and grew to about 120 mm. (total length of about 5.6 in.) by the following April, by which time the first annual mark had formed. At that time the modal length of fish having 2 marks was about 165 mm. (total length of about 7.7 in.), and of those having 3 marks, around 195 mm. (total length of about 9.1 in.). Though the study has been concerned only with young fish, it has, by defining age marks and proving their annual occurrence, made way for a similar study of the scales of older fish. Of these, there are 2 groups: Young adults usually caught during the fall months, and older adults caught in northern waters during the summer and in California waters during the winter. During 1939 an extensive collection was made of the scales of both groups from Grays Harbor, Wash., and from Monterey, Calif. A preliminary examination of the scale samples gives promise of success in determining the age of commercial-sized fish.

## SAMPLING

Sampling of the commercial catch was carried on in California at San Pedro, Monterey, and San Francisco shore plants by the California State Fisheries Laboratory; at floating reduction plants operating off San Francisco and at Grays Harbor, Washington, by the U. S. Bureau of Fisheries; at Astoria by the Oregon Fish Commission; and at British Columbia by the Fisheries Research Board of Canada. Preliminary study of these samples, and of those taken in California in each of the preceding 20 years by the California State Fisheries Laboratory, indicates that the pilchard population is by no means distributed at random and that a simple summation of samples, however intensively taken, cannot be expected to represent fairly the population. Apparently the fishery draws on a succession of "runs" in each locality. These runs vary in their duration, and differ significantly with reference to the size and the abundance of fish composing them. These variations are probably connected with peculiarities in hydrographic conditions which change during the season, and from season to season. For example, a set of hydrographic conditions conducive to catching small fish for a relatively long period of time in one season, as compared with another set of conditions which permit fish of that size to be caught during a short period of another season, will cause overrepresentation of the small size in the one season as compared with the other. During 1938–39 a method of weighting the samples to eliminate part of the distortion has been devised. Unfortunately, that method results in each run being given equal weight, and, though it is perhaps an improvement over an unweighted series, it still does not represent the relative abundance of the various sizes because the relative abundance of the fish in the various runs is not taken into account. A method of treatment which will accomplish the desired results remains to be discovered. Until then, our information on the relative strength of year-classes in the commercial fishery, the rate at which they have been consumed by natural and fishing mortality, in short, the condition of the resource, can only be understood imperfectly.

### EARLY LIFE HISTORY

It has been reported[5] that there is some relationship between temperature and successful survival. As yet it is unknown whether it is the temperature alone that governs survival, or whether it is other things associated with temperature, for example, ocean circulation. To investigate further the factors related to survival, a preliminary oceanographic survey of the waters off California, Oregon, and Lower California was carried on during the spring and early summer, when 90 stations were occupied; some of them as much as 320 miles offshore. The Scripps Institution of Oceanography cooperated by taking serial temperatures, making salinity and oxygen determinations, and phytoplankton and zooplankton hauls at all stations visited. The Institution is now studying the hydrographic data to elucidate the system of currents.

The Bureau's collections of fish eggs and larvae at the same stations will afford knowledge of the relationship between the distribution of young stages of pilchard and the various water masses in the circulation pattern. Off central, southern, and Lower California, substantial numbers of young stages of the pilchard were found well offshore in a band lying 125–175 miles off Monterey, 75–125 miles off San Pedro, and 75 miles off Enseñada. Thus the bulk of the planktonic stages were taken well outside the range in which most of the commercial fish are caught prior to the spawning season, indicating that the fish largely go offshore to spawn. No stations were occupied off northern California, owing to rough weather. A few eggs were taken at widely scattered stations off the Oregon coast, although not enough of them were obtained to define their zone of distribution. The survey off Oregon was made rather early in the season, possibly before the climax of pilchard spawning had been reached, and conversely in southern and Lower California rather late in the season, undoubtedly after the climax of spawning had passed. It was impossible to reach all parts of the area in the limited amount of time with only one boat. It is probable that the stations visited off central California were occupied near the time of the spawning peak in that locality. If so, the amount of spawning there was substantially less than in southern California.

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[5] Progress in Biological Inquiries, 1938.

To arrive at a more definite knowledge of the distribution of spawning requires simultaneous operation of several research boats, so that stations could be more closely spaced and visited a number of times during the spring and summer. The importance of such simultaneous surveys cannot be overestimated, for this is the most direct means, possibly the only one, of determining whether the spawning stock is being maintained at a sufficiently high level to provide adequate replacement for a large and intensive fishery. The possibility of a concerted oceanographic program would be greatly enhanced were a Bureau research boat available to participate with other agencies that maintain research boats in this region.

## CONDITION OF THE RESOURCE

It is apparent from the foregoing that present information concerning the pilchard is imperfect, and that nothing final can be said relative to the exact status of its stock. Nevertheless, a number of observations already made indicate strongly that the present large commercial fishery is producing its effect. Prior to the season of 1937–38, fishermen in California always were able to supply as much fish as processors could accept, and often more. During this period the total catch rose at a logarithmic rate (i.e., at an equal percentage per annum), increasing 14 percent per annum, or, roughly, doubling every 5 years. In 1937–38, however, for the first time, the supply failed to meet the demand, in spite of a rise in price from $10 to $13 per ton. This situation could mean that during the preceding years the size of the stock had declined; it could signify that the availability of the fish changed abruptly that season; or it could indicate that the demand had outgrown the ability of the fishermen to supply pilchards at a price economically in line with other competitive raw materials. It could also mean, and probably does mean, that a combination of these three causes was effective. In any case, it is likely that further expansions of the industry might not be economically sound, regardless of whether or not there was an actual decline of pilchards in the sea.

A further apparent effort of exploitation in California, first observed during the season of 1937–38, is the occurrence in the catch of an unusually large proportion of small fish, or, conversely, a low proportion of large fish. This might, and probably does, signify that recent years had produced unusually successful year classes. If the large fish, however, were fully as abundant as formerly, then the addition of these quantities of small fish should have increased the abundance markedly, and the catch per boat should have risen by the season of 1938–39 substantially more than the observed 15 percent. Available information suggests that the population of older fish had been reduced more than had been offset by the accessions of young fish in 1938–39, although the current season of 1939–40 promises to constitute a more marked recovery.

In Oregon and Washington, it is difficult to appraise the condition of the pilchard resource; first, because the industry there is so young; and second, because of the suspicion that a varying proportion of the population of old adults migrate annually to the north to be caught in the fishery. It is fairly certain, however, that the abundance of pilchards visiting Oregon and Washington waters must be limited by the size of the stock of old adults left after the much larger California fishery has taken its toll.

The evidence of exploitation discussed above, though subject to some uncertainties, taken together, indicate that the pilchard industry has reached maturity. By this is meant that it has arrived at a point where further expansion can result only in a rise of production cost. The industry is also at a point where it is likely to feel the effect of fluctuations in natural abundance more than it has in the past. It may even have overexpanded to the extent where the present level of total catch cannot be indefinitely maintained. If so, the effect of this situation may be that the successful year-classes, which occur as a rule only once in several years, will not persist long enough to last until succeeding successful year-classes appear. During such interims the industry will suffer for lack of raw material and this effect would probably be apparent rather soon. A second effect to be expected, theoretically, would not be so readily or so quickly apparent; i. e., a reduction in the spawning population to the point where so few eggs would be spawned that, even under conditions favorable for survival, the successful year-classes would not be so large as formerly. Thus, the fishery would have, over a long period, a downward trend, and would face not only a sharply fluctuating supply, but fluctuations at an increasingly lower level.

## GREAT LAKES FISHERY INVESTIGATIONS

Dr. John Van Oosten, *in charge*

The Great Lakes staff, under the direction of Dr. John Van Oosten, in 1939 as in 1938, devoted its attention largely to the continuation or completion of projects already under way. Ten publications appeared in 1939, and 4 papers, totalling 380 manuscript pages, are now in the hands of the printer. Several other reports are complete or nearing completion. Field work during the year was limited to a brief preliminary survey of the sport and commercial fisheries of Grand Traverse Bay, Lake Michigan.

One of the most significant events of the year was the revision of the commercial fishing regulations for the State of Wisconsin waters of Lake Michigan in October 1939, which constituted another important step toward the attainment of uniform regulations for all waters of that lake. The executive order, which was issued under the provisions of Wisconsin's discretionary power act, will, if enforced, bring the regulations for the Lake Michigan waters of that State as to size limits, mesh sizes, and closed seasons substantially in agreement with the State of Michigan regulations. Although a majority of the commercial operators previously had agreed to accept the provisions of the order, certain fishermen obtained a temporary injunction to prevent the conservation department from enforcing the new regulations. It is anticipated that the case will reach the State Supreme Court for final settlement.

On the whole, the past has been marked by an increasing interest on the part of the general public in the welfare of the Great Lakes fisheries. Newspapers in the Great Lakes region, and sportsmen's journals, have repeatedly carried articles calling attention to the critical depletion of the commercial species and pointing out the need for adequate and uniform fishery regulations in Great Lakes waters. A similar interest in the Great Lakes fisheries was demonstrated by the resolution passed at the National Convention of the Izaak Walton League of America commending the Council of State Governments for its efforts to obtain the negotiation of a treaty with the Dominion of Canada for the establishment of an international board of inquiry "to the end that uniform regulations may be secured" in Great Lakes waters.

The rapidly increasing popularity of sport fishing in Great Lakes waters, with the consequent growing demand for the protection of game-fish species, and for the closure of certain waters to commercial fishing, bids fair to give rise to administrative problems of major importance. It is recognized generally that the monetary returns to Great Lakes communities for fish taken by tourists are far greater than the returns for an equal quantity of fish produced in the commercial fishery. It is economically expedient, therefore, to encourage the greatest possible development of sport fisheries and to provide adequate protection for game fish in those localities in which sport fisheries become established. On the other hand, it is unsound to place undue restrictions on the commercial fishery, particularly on the fishery for rough fish and other species of no interest to sportsmen. The indiscriminate closure of bays and other water areas to commercial fishing may provide valuable protection to game fish, but at the same time it may deprive local communities of revenues from commercial operations that could have been carried on without the slightest harm to the stock of game species. Unfortunately many sportsmen do not understand this situation. As a result, State legislatures are subjected continually to heavy pressure from sportsmen's organizations which seek to have this region or that region of the Great Lakes closed to all commercial fishing. Some extremely productive waters have already been closed when a few minor restrictions on commercial fishing operations would have been fully adequate for the protection of the game-fish species.

If the unwarranted closure of Great Lakes waters to commercial fishing is to be avoided, and if certain areas already closed are to be reopened, it will be necessary to obtain extensive factual data on the relationship between the sport fisheries and the commercial fisheries of the Great Lakes, and with this information to convince all concerned that there is no important conflict between the best interests of the sport and commercial fisheries.

Experience has demonstrated the special importance of preventing the development of antagonism on the part of the public toward the fishing industry. A bitter but valuable lesson on this point was obtained in connection with the closure, by act of the Michigan Legislature, of Potagannissing Bay in northern Lake Huron. Although an impartial survey conducted cooperatively by the Bureau and the Michigan Department of Conservation demonstrated conclusively that the commercial fishery in the bay was not harmful in any important degree to the stock of smallmouth black bass, and that only limited restrictions on commercial operations would provide that species with almost complete protection, the sport fishermen nevertheless insisted upon and obtained the complete closure of the waters under dispute.

In order to better acquaint sport fishermen with the true relationship between the sport and commercial fisheries, and to prevent a repetition of the misunderstanding that occurred in connection with the Potagannissing Bay controversy, Dr. Van Oosten has, within the past 2 years, accepted a number of invitations to speak before sportsmen's organizations in the Great Lakes area. He has agreed also to cooperate in an advisory capacity with the Michigan Department of Conservation in a survey of the sport and commercial fisheries of Grand Traverse Bay, Lake Michigan, the leading center of the "deep-sea" trolling fishery for lake trout.

The appointment of Dr. Van Oosten on Feb. 2, 1939, to the Water Resources Committee (of the National Resources Committee) for the Lake Ontario-St. Lawrence-Champlain Basins, gives the Bureau representation on the basin committees for the entire Great Lakes region. Dr. Van Oosten previously had been made a member of the Upper Great Lakes—Superior, Michigan, and Huron—and the Lake Erie Basin Committees.

The long-established policy of full cooperation with other agencies, particularly the State departments of conservation, was continued through 1939. Dr. Van Oosten attended 12 meetings and conferences at which Great Lakes fishery problems were considered, and with others was directly instrumental in obtaining the Governor's signature to the executive order containing revisions of the Wisconsin fisheries code. Five presentations of the moving picture, "Great Lakes Fisheries Investigations," were made before groups of scientists and sportsmen.

### FISHERY STATISTICS

The completion of the analysis of the 1938 commercial fisheries statistics for the State of Michigan waters of the Great Lakes under the direction of Dr. Ralph Hile, made available detailed information covering a 10-year period on the fluctuations in the production and abundance of important commercial species, and in the intensity of the fishery in each of the 21 statistical districts into which the State of Michigan waters have been divided. The pronounced decline in the production and abundance of whitefish in Lake Huron constituted the outstanding feature of the 1938 data. The production of only 558,000 pounds was the second lowest on record and was only a little more than one-eighth of the record productions of 1931 and 1932. The abundance index for whitefish in 1938 was only 29 percent of the 1929–34 average. The decline of the Lake Huron whitefish has been, in large measure, due to the overproduction made possible by the use of the extremely efficient deep trap net. Although the deep-trap-net fishery was investigated thoroughly by the Bureau and the Michigan Department of Conservation in 1931 and 1932, and regulations for its control suggested in the latter year, effective laws restricting the use of this gear were not forthcoming until the whitefish stock of Lake Huron suffered serious, possibly irreparable, damage.

### RED LAKES INVESTIGATION

In response to repeated requests by the Commissioner of Indian Affairs, addressed to the Commissioner of Fisheries, Drs. John Van Oosten and Hilary J. Deason made a brief survey of the fisheries and fisheries resources of the Red Lakes during the period Aug. 23 to Sept. 10, 1938. The commercial fisheries of the Red Lakes, first begun in the fall of 1917, constitute one of the principal sources of livelihood of the Red Lake Indians who, since 1929, have marketed their catches through their own cooperative under the supervision of the Superintendent of the reservation. Regulations for the conduct of the fisheries are promulgated by the Commissioner of Indian Affairs, United States Department of the Interior. Frequent controversies over the regulations and criticisms of the methods of conducting the fisheries, as well as assertions that the Red Lakes were becoming depleted, led to the need for an investigation of the various problems in order to find some means for their solution. The biological data, statistical records, and historical and documentary information accumulated during the course of the survey have been studied and embodied in a formal report that is approaching completion.

The statistics of the annual production of the Red Lakes fisheries yield no positive evidence of a decline. The observance of an arbitrarily assigned maximum production limit of 650,000 pounds per year of the most desirable varieties appears to provide insurance against overexploitation of the stock. The catches per unit of fishing effort in the Red Lakes compare favorably with the catches per unit of effort in some of the best fishing areas of Lakes Michigan and Huron.

The growth of the wall-eyed pike (*Stizostedion vitreum vitreum*) is slower in Lower Red Lake than in Lake Erie, Lake Champlain, or Lake of the Woods, but is superior to the growth of the same species in Lakes Nipigon and Abitibi (Ontario). The relatively slow growth of the Lower Red Lake wall-eyed pike is compensated to some extent by its heavy stature, since the coefficient of condition, $K$, for wall-eyed pike was higher than for any population for which such data have been obtained. There is no basis for the assertion that the wall-eyed pike of Lower Red Lake are inferior to other populations for commercial purposes because of their slenderness. The Red Lake wall-eyed pike reaches the size limit of 14 inches, fork length (about 15 inches, total length), during the fifth year of life. The commercial catches consisted principally of members of age-groups IV and V. Studies of the percentage maturity at different lengths revealed that the 14-inch size limit (fork length) is adequate to permit the majority of females to spawn at least once before they reach commercial size.

The yellow perch (*Perca flavescens*) of Lower Red Lake grows more slowly than the perch of Lake Erie and Nebish Lake (northern Wisconsin), but more rapidly than the perch of two other northern Wisconsin lakes. As was true of the wall-eyed pike, the yellow perch of Lower Red Lake had a higher average value of the coefficient of condition than any other perch population for which data are available. The commercial catch of yellow perch was composed, in the main, of members of age groups V to VII, with age group VI predominating. Perch of younger ages and of smaller size could be taken with profit and without danger of depleting the stock. However, the gill-net mesh used in the Red Lakes must remain adjusted to the more abundant and commercially valuable wall-eyed pike, and therefore the most efficient utilization of the perch population cannot be effected. The continued use of a gill-net mesh of no smaller than 3½ inches appears to be an adequate safeguard against depletion of the yellow perch.

The whitefish (*Coregonus clupeaformis*) of the Red Lakes, judging from the meager data available, grows at an intermediate rate compared with seven other North American populations. The Red Lakes whitefish had a larger coefficient of condition than the whitefish of Lakes Huron and Champlain. The growth of the goldeye (*Amphiodon alosoides*) compared favorably with the growth of the species in lakes of the Prairie Provinces of Canada; fish of some age groups averaged larger, and some smaller, in Lower Red Lake than in the Canadian lakes. The sheepshead (*Aplodinotus grunniens*) of the Red Lakes grew slightly slower but had a higher average coefficient of condition than the sheepshead of Lake Erie.

Records of the artificial propagation of Red Lakes wall-eyed pike and whitefish and the stocking of other waters at the expense of the Red Lakes have been assembled and considered with a view toward recommending a future policy of artificial propagation. A more definite mesh size for gill nets, and the adoption of the flexible rule as the official method of measuring nets, will be included among the final recommendations. Additional matters related to a future policy for the Red Lakes fisheries also are being considered.

## MIGRATION OF LAKE MICHIGAN FISHES

The results of extensive tagging experiments on Lake Michigan fish, conducted between June 1929 and August 1931 by Smith Bros., commercial fishermen of Port Washington, Wis., are contained in a joint publication (in press) by Mr. Oliver H. Smith and Dr. John Van Oosten. The project resulted entirely from the interest and initiative of the late Lester Smith and of Oliver H. Smith, who jointly defrayed all expenses—an unparalleled undertaking among Great Lakes fishermen.

Of the 2,902 Lake Michigan fish tagged and released, 48.8 percent were lake trout, 20.4 percent lake herring, 15.7 percent whitefish, 5.1 percent rainbow trout, 4.2 percent yellow perch, 3.6 percent lake chubs, and 2.2 percent were other commercial species. A total of 388 fish, or 13.4 percent of the total number tagged, was recaptured. The percentages of returns for the lake trout, whitefish, and sturgeon indicate a tremendous fishing intensity in Lake Michigan. Four of the five tagged sturgeon were recovered. It was estimated that more than 31 percent of the baby lake trout (12.8 in.) and more than 44 percent of the young whitefish (11.8 in.) later entered the commercial nets. About 28 percent of the lake trout recovered were legal in size, and about 14 percent of the recaptured whitefish were of legal length. About 51 percent of the recovered fish were taken within 10 miles from Port Washington, the port of tagging, and 81 percent were taken within a radius of 25 miles from that port. Lake trout, rainbow trout, and sturgeon were found to be extensive travelers; lake herring, whitefish, chubs, pilots, and perhaps perch, did not migrate so extensively. Lake trout, herring, and whitefish tended to move in a northerly direction, perch in a southerly, and rainbow trout in an easterly direction toward the Michigan shore. Sturgeon apparently roam all over the lake.

Fifty-three percent of the recovered lake trout were recaptured within 1 year of release; 73 percent within 25 miles from Port Washington. It required 3 years for the trout to become fairly well scattered throughout the lake. With the attainment of adulthood lake trout moved in all directions from the port of release, although nearly 50 percent of the adults were retaken within 25 miles from this port.

Data are given on the growth and estimated age of the tagged lake trout, rainbow trout, whitefish, and sturgeon. It was found that the minimum size limits of lake trout and whitefish on the Great Lakes are economically unsound—they are too low—because they permit the capture of these species at the time of the most rapid increase in weight.

### AGE AND GROWTH STUDIES

*Saginaw Bay yellow perch.*—A study of the age and growth of the yellow perch, *Perca flavescens* (Mitchill), of Saginaw Bay, by Dr. Ralph Hile and Mr. Frank W. Jobes, has been completed and the first draft of the report prepared. Age determinations and computations of individual growth histories were made from the examination and measurement of the scales of 820 individuals collected in 1929 and 1930. The investigation of the length-weight relationship was based on data from 1,483 specimens, and the ratio between total length and standard length was determined from measurements of 1,411 fish. The report contains also a review of the statistics of the commercial production of perch in Saginaw Bay in the years 1891–1908 and 1916–38. The average annual production in the years 1917–38 has been only 28 percent of the 1891–1916 normal.

The method of calculating growth from scale measurements, based on a study of the relationship between body lengths and the lengths (radii) of "key," or selected scales from 512 fish, resembled that employed earlier for the calculation of the growth of the Lake Erie perch. The use of direct-proportion calculations was found to be valid for all calculated lengths above 101 mm. Calculated lengths of 101 mm. and less had to be corrected (from an empirical curve of the body-scale relationship) to compensate the disproportionate growth of body and scale in small fish. Both sexes of the Saginaw Bay perch attain the legal length of 8½ in. during the fourth year of life, just as they are entering on the period of most rapid growth in weight. Growth of females is slightly more rapid than males, both in length and in weight. The length-weight relationship (sexes combined) was described by the equation, $W=0.9826\times10^{-5}L^{3.2174}$, where $W$=weight in grams and $L$=standard length in millimeters. The ratio of standard length to total length was found to increase with the increase in the length of the fish.

*The Lake Michigan kiyi.*—The kiyi, *Leucichthys kiyi* Koelz, is one of two species of chubs inhabiting the deepest waters of Lake Michigan that practicably may be exploited with gill nets. During the Lake Michigan investigation of 1930-32, scale samples, accompanied by data on length, weight, sex, and stage of maturity, were collected from 1,516 individuals. The scale samples, along with other data obtained during an analysis of the catches of experimental gill nets of various sizes of mesh, have been employed for a study of the life history of the kiyi by Drs. Deason and Hile. The bulk of the scale material has now been studied. Growth rate is very rapid during the first year for fish in all parts of the lake, and averages about 100 mm. The increment during the second year is less than half of the first-year increment, and the growth rate decreases perceptibly during each of the later years of life. There appears to be an inverse relationship between latitude and the rate of growth. A slightly more rapid growth is indicated for the females than for the males. The scale collections, obtained from unassorted samples of the commercial catches of different sizes of mesh, between 2⅜ and 2¾ in., stretched measure, consisted of members of age-groups II to VIII. The best represented age groups were III, IV, and V. The report will include also data on bathymetric distribution and on the occurrence of the kiyi in the different regions of Lake Michigan.

## COOPERATIVE INVESTIGATIONS OF WISCONSIN LAKES

The Bureau continued to cooperate with the Wisconsin Geological and Natural History Survey in their limnological and fishery investigations of the lakes of northeastern Wisconsin by providing a small amount of financial assistance. Those investigations, conducted under the direction of Drs. E. A. Birge and Chancey Juday, are concerned with the study of long-term problems of theoretical and applied limnology and fishery biology.

Materials collected during the course of the cooperative investigations, 1930–32, during which time Dr. Ralph Hile, of the Bureau, was assigned to that work, have formed the basis for two fish papers, both of which are now in press.

*Bathymetric distribution of fish.*—Records of fishing operations with gill nets were employed by Drs. Hile and Juday in a study of the vertical distribution of fish in summer in five northeastern Wisconsin lakes. Comparisons of data for different lakes revealed that the depth of water inhabited by a single species varies rather widely from one lake to another; that the relationship between size of fish and depth of water inhabited varies from lake to lake; and that different species that live at the same depths in one lake may inhabit different depths in another. The variations in the bathymetric distribution of fish exhibited no clear-cut correlation with differences in temperature and the concentration of dissolved oxygen and free carbon dioxide. This lack of correlation was not taken as evidence that temperature and the concentration of dissolved gases are of little importance in determining the bathymetric distribution, but rather that other, undetermined factors may obscure the effects of physical-chemical conditions.

*Growth of the rock bass.*—The study by Dr. Hile of the growth of the rock bass, *Ambloplites rupestris* (Rafinesque), in northeastern Wisconsin placed emphasis on the problem of annual fluctuations in growth rate and the strength of year-classes. The growth rate of the Nebish Lake rock bass varied from a maximum of 20.6 percent above average in 1931, to a minimum of 15.2 percent below average in 1928. The year-classes ranged in strength from the phenomenonally rich

1923 year-class, which as age-group VIII made up 45.8 percent of the 1931 collection, to the extremely weak 1927 year-class, which as age-groups III to V contributed only 1.7 to 5.9 percent of the total collections of 1930–32. In general, strong year-classes occurred in years of good growth—in the second and later years of life—and weak year-classes were produced in years of poor growth. Peculiarly enough, first-year growth and the strength of the year-classes exhibited no correlation.

The analysis of the annual fluctuations in growth rate, and the strength of the year-classes of the Nebish Lake rock bass in relation to meterological conditions, showed good growth to be correlated with high temperatures in June and September, and heavy rainfall in June. It was suggested that annual variations in temperatures in June and September may produce variations in the length of the growing season. The correlation between June precipitation and growth may depend on the enrichment of the waters of this extremely oligotrophic lake by materials washed in during periods of heavy downpour. Substances added in June may be more fully available for utilization than those introduced in other months. Strong year-classes were correlated with high temperatures and heavy precipitation in early season, with conditions in June especially significant. High temperatures and an enrichment of the lake by run-off water may produce favorable feeding conditions for small rock bass at a critical period of their life history.

Comparisons of the data for the Nebish Lake rock bass with similar data for stocks from neighboring lakes suggest that to some extent the effects of meteorological conditions on different populations may be similar. For example, the 1923 year-class of rock bass was exceptionally strong in Muskellunge Lake and Trout Lake, as well as in Nebish Lake. Furthermore, good growth of rock bass and high temperatures, especially in June, were correlated in Muskellunge Lake, and apparently in Silver Lake. On the other hand, a number of discrepancies suggested that conditions peculiar to the individual lakes at times may modify or obscure the effects of the weather on growth rate and the strength of year-classes. There was some evidence also that the growth rate and the survival of young in different calendar years may be affected by fluctuations in the density of the population.

*Progress during 1939.*—A study of the growth of the bluegill, *Lepomis macrochirus* Rafinesque, of Muskellunge Lake, has been completed and submitted for publication by Dr. Clarence L. Schloemer, who has also made progress with an investigation of the life history of the wall-eyed pike, *Stizostedion vitreum vitreum* (Mitchill), in Wisconsin waters, and a paper on methods of determining the magnitude of fish populations. Mr. David G. Frey has nearly completed his work on problems related to the carp, *Cyprinus carpio* Linnaeus, in Wisconsin lakes, and continued a creel census on Lakes Waubesa and Kegonsa. Mr. Willard A. Van Engel terminated a study of the growth of the northern pike, *Esox lucius* Linnaeus, in Wisconsin waters, and undertook an investigation of the black crappie, *Pomoxis sparoides* (Lacépède), which will be continued for 3 or 4 additional seasons. Dr. Schloemer and Messrs. Frey and Van Engel are members of the staff of the Wisconsin Geological and Natural History Survey.

## SHELLFISH INVESTIGATIONS

DR. PAUL S. GALTSOFF, *in charge*

In accordance with the previously adopted program of the Bureau's shellfish investigations, the research on oysters was conducted during the past calendar year with the following objectives: (1) To increase our technical knowledge regarding the methods of propagation of oysters under various conditions of the coastal waters; (2) to find practical means of improving the quality of marketable oysters; (3) to improve the methods of protection of oysters against various pests and parasites; and (4) to determine the deleterious effects of polution and to devise methods of rendering certain trade wastes harmless to oysters. Since the accumulation of technical knowledge remains useless until the findings of the experts are brought to the attention of interested persons, considerable effort was made to disseminate the acquired information by preparing memoranda and pamphlets containing summaries of the most recent investigations, and distributing them among the oyster growers.

In compliance with the request of the local oystermen, the Bureau's station at Milford, Conn., continued throughout the summer of 1939 to issue weekly bulletins containing information concerning the condition of oyster gonads and the expected time of setting, and supplied detailed data concerning the distribution of starfish in Long Island Sound. Although these bulletins contained only local information pertaining to a small area along the Connecticut shore of the Sound, demands for them were received from oystermen operating in the States of New York, Rhode Island, and Massachusetts.

As in the past, the Bureau's investigations were greatly facilitated through the cooperation of the following organizations: W. P. A., P. W. A., N. Y. A., Connecticut Shell Fish Commission, Virginia Commission of Fisheries, William and Mary College, North Carolina Fish Commission, South Carolina State Board of Fisheries, Beaufort County Commissioners, and Florida Department of Conservation.

Oyster-fishery studies were conducted at the Bureau of Fisheries Laboratories at Woods Hole, Mass.; Milford, Conn.; Yorktown, Va.; Beaufort, N. C., and Pensacola, Fla. Temporary headquarters for oyster-farming investigations were established also at Beaufort, S. C.

In compliance with the requests of the United States War Department, Corps of Engineers, special surveys were made of the oyster bottoms in the upper part of Buzzards Bay, and in Narragansett Bay, for the purpose of determining the effect of dredging operations on oysters. In cooperation with the Bureau of Construction and Repair, United States Navy, special observations on the fouling of ships' bottoms were conducted at Langley Field, Va., and at the Bureau's stations at Milford, Conn., and Pensacola, Fla.

### OYSTER-CULTURE STUDIES

*Woods Hole.*—Laboratory studies of the factors controlling the spawning of oysters, conducted for a number of summers by Dr. Galtsoff at the Woods Hole Station, were completed and the results of the findings, summarized in three technical papers, were published in the Biological Bulletin, Vols. 74, 75, and 78. It has been demonstrated by this investigation that an old concept of a single critical temperature that induces spawning in oysters is no longer tenable. Depending on the physiological state of ripeness, the oyster may spawn at various temperatures between 63° and 95° F. A thermic stimulus alone often is not sufficient to induce spawning, and a combined action of temperature and chemical stimulation are necessary to produce the desired effect. However, a number of chemical compounds were found to be effective in inducing spawning of the male oyster.

These physiological studies provide a key to a practical method of controlling the spawning of oysters under natural conditions. To speed up the discharge of spawn, ripe oysters from deep bottoms should be brought into shallow, warm water of the inshore areas and left there for a few days. Additional stimulus can be provided by opening a few ripe oysters, mincing their meats in sea water, and scattering this mixture over the bed of spawners. The method was tried with success by some of the oyster growers of Long Island Sound and in British Columbia.

Since it has been demonstrated that the proximity of both sexes is essential for a successful spawning of oysters, it would be expected that a considerable disparity in the sex ratio may interfere with their propagation. Previous field observations have demonstrated the prevalence of females among the adult oysters on certain oyster bottoms. An investigation of the problem, initiated by Dr. Galtsoff in 1937 and continued through the present year, showed that the increase in the female population is primarily due to the sex change among adult oysters. Continuing this study during the present fiscal year, 200 individually marked oysters, which were kept at Woods Hole and Milford, were retested for spawning. An analysis of the records obtained during the 3 consecutive summers shows that sex change among adult oysters occurs in both directions; i. e., from male to female as well as from female to male. It is interesting to note, however, that during the 3-year period 17.6 percent of the oysters under observation changed from female to male, as compared with 31.2 percent changes from male to female. Thus it is obvious that in spite of the change of a certain number of females to males, the proportion of females in the oyster population steadily increases with age.

From these data it is apparent that the maintenance of a more or less normal sex ratio is essential for successful propagation of oysters. For practical purposes, the problem can be solved by adding each year a sufficient number of 3-year-old oysters to the stock of old spawners.

A study of sex reversal in adult oysters is being continued with the view of determining genetic and environmental factors which control these changes.

*Long Island Sound.*—Observations on the development of gonads, spawning, setting, and mortality of oysters were continued by Dr. Victor L. Loosanoff and James B. Engle, of the Bureau of Fisheries Laboratory, Milford, Conn. The area under investigation, extending for about 30 miles from Bridgeport Harbor to Morgan Point, east of New Haven, represents the largest and most important part of the Connecticut seed-oyster producing section. The methods employed in this study were the same as those used during the 2 previous years.

The development of gonads was followed since May 18, 1939, by making weekly inspection trips over the entire area under observation. By June 23, the average thickness of the gonad layer of oysters was about 2.8 mm., somewhat less than during the corresponding period of 1938 (3.3 mm.) and consideraly below that of 1937 (4.3 mm.). From June 23 to June 28 the gonads increased to 3.1 mm. By this time many of the oysters were completely ripe, and some of them already had partially discharged their spawn. Two days later, partially spawned animals were found at almost all stations, and the average thickness of gonad layer decreased to 2.7 mm. Oysters from comparatively shallow areas were the first to spawn. Spawning soon began to be of more general occurrence, and on June 30 some oysters with partially discharged gonads were found at almost all depths ranging from mean low-water mark to 40 feet. As in the previous year, the temperature of water prior to and during the early period of spawning was several degrees below 20.0° C.

Systematic observations on the setting of oysters were made at 10 stations at Stratford Point, and 6 stations at Welchs Point. Additional weekly observations were made at 15 other stations located in different sections of the Connecticut oyster-growing area. The first light set of the year was recorded at Stratford Point on and around July 17, 1939, about 2 weeks after the first general spawning, at depths ranging from mean low water to 50 feet. Between July 20 and 24 the intensity of setting increased considerably, but decreased sharply after July 31. There was no setting between August 3 and 17. From then on until September 21, scattered and very light sets took place at medium depths and in shallow areas. Observations were continued until the first part of October but no new spat were found after September 21.

In the Welchs Point area the first setting occurred between July 18 and 21, and the last set was recorded on September 12. The peak of setting took place between July 25 and August 1. During that period setting was exceedingly heavy, especially at 30-foot depth, sometimes averaging over 380 spat per shell. In some samples, shells containing as many as 1,000 spat were found. After August 1 the intensity of setting sharply declined for the rest of the season.

Setting of oysters in 1939 was probably the heaviest since 1930, and certainly much heavier than in 1937 and 1938, although the quantity of spawn developed in 1939 was very small. This observation disproves the old idea that a good setting can be expected only in those years when the gonads develop large quantities of spawn. Of special interest is the observation that in 1939 the spawning and heavy setting of oysters took place during a period of prolonged and very severe drought. Prior to and during that period the river discharge, as well as the amount of precipitation, was exceedingly low. Considering the fact that setting in 1939 was much heavier than in many previous years, the question naturally arises whether the inflow of fresh water carrying certain substances is really important in inducing the setting of larvae.

*North Carolina.*—Experimental studies of the growth, reproduction and survival of oysters at different tidal levels were continued at the Beaufort, N. C., Laboratory, under the direction of Dr. Herbert F. Prytherch. The purpose of this investigation is to obtain the essential information required for improved cultivation of oysters on the extensive tidal flats of this region. Though conditions above low-water level are unusually favorable for growth, the oysters produced in this zone are of inferior quality because of the overcrowding resulting from prolific natural reproduction. Biological studies show that oysters in this region have two heavy spawning and setting periods; in June and September. The late set usually completely covers the first set, which is attached to the shells and other cultch scattered over the tidal flats. The chief problem, therefore, in producing oysters of good marketable size and quality on these areas, is to find a method of preventing "fouling" of cultch during the summer season. The principal lines of investigation undertaken were to determine the following: (1) The growth of seed and adult oysters at different tidal levels; (2) the intensity of oyster setting or other fouling of these oysters in relation to their vertical position; (3) the possibilities of controlling fouling by shifting of oysters in special holding devices to favorable depths during the spawning season, and (4) the value of specially constructed salt-marsh ponds and canals for intensive cultivation of oysters where control of depth, current velocity, and other factors is possible.

Four hundred oysters, 1 and 2 years of age, were attached to cement panels and studied with respect to growth in weight, volume, length, and width in relation to their position above and below low-water level. Additional records were kept of a series of 180 oysters, which were studied individually during the previous year to determine the effect of orientation on growth. Three series of panels were placed under the main pier in Beaufort Harbor, using the same arrangements described for the experiments in 1938. Four other series of 100 oysters each were placed at levels just above and below mean low-water mark in the improved marsh ponds and canals constructed adjacent to the laboratory. The unit panel employed in these experiments consisted of a reenforced slab of "Incor" cement, 34×3×¾ in., to which the oysters were fastened with a detachable cement.

The general results of the entire series of experiments may be briefly summarized as follows: (1) In this region the most rapid growing level for oysters is found in the tidal zone extending from approximately 6 in. below low-water level to 12 in. above. (2) When seed oysters (year-old size) are placed in this zone they will reach good marketable size in 2 years and show an increase in volume ranging from 750 to 1,200 percent, and in weight from 860 to over 1,000 percent. (3) The essential conditions required for attaining this growth are a good circulation of water, ample space for expansion, exposure to air for short periods, and protection from overcrowding and smothering by other marine organisms. (4) The greatest increases in weight and size were obtained in the groups of seed oysters that were held in a vertical position with the hinge uppermost. Less than 10 percent of these oysters died during the 2-year period of experimentation. (5) The growth of oysters in North Carolina waters is most rapid during the late fall, winter, and early spring, and apparently is associated with the more favorable conditions at that time for the growth of marine plant life.

Experiments in the improved marsh ponds and canals demonstrated that it was possible to utilize such areas for growing and maturing oysters because the attachment of spawn could be prevented by regulating the depth of water and velocity of currents. On adjacent outside beds the oysters had become "wrapped up" with spat by fall, while those in the ponds at the same level were free to continue their growth to a good marketable size. Even in experiments using the poorest type of seed from "coon" oyster beds, a growth in volume of over 300 percent was obtained the first year, and a long, fairly wide type of marketable oyster, for shucking purposes, developed. The seed oysters which were held on cement panels and in special trays showed an increase in volume of over 200 percent from August through December and were rapidly forming round, scalloped shells of the most desirable type. By holding seed in these devices it was possible in the experimental canals to cultivate oysters at concentrations equivalent to over 2,000 bushels per acre, regardless of the nature of the bottom. In general, the experiments indicate that the expensive procedure of cultivating oysters in controllable tidal bays and canals is practical because of the more favorable circumstances for protection and harvesting of the crop, and primarily because a high yield of better quality oysters may be secured. These experiments are being continued and developed on a small commercial scale in order to determine the maximum size and age attainable by oysters in these waters and the percentage of mortality to be expected according to age and environmental conditions.

*South Carolina.*—The experimental oyster farm established by the Bureau near Beaufort, S. C., late in 1938 has now been in operation for a full year, and considerable information respecting the problems of utilizing various types of bottom for seed production has been accumulated by Robert O. Smith, in charge of this investigation.

Distinctive conditions existing in the brackish waters of South Carolina and Georgia have long presented special problems to oyster growers. This section of the South Atlantic coast is unique in three major respects: (1) There is as much as 10 feet difference between high and low tide; (2), the great majority of natural oyster beds occur between tide lines; and (3), setting is so abundant that single seed oysters are difficult to obtain.

Under these conditions it is imperative that the oyster grower be provided with means for determining the relative value of various types of bottom for seed production, growth, and fattening of oysters for market. The cost of leasing bottom from the State is relatively high, making it economically unsound to lease sections which will be unproductive. At the same time practical methods of obtaining good seed at low cost must be found, and, in the case of market oysters, means of fattening them early, despite high water temperature, are desirable.

Using colored labor provided by a W. P. A. project sponsored by Beaufort County, and with the active cooperation of the South Carolina Board of Fisheries, about 25 acres in a representative creek are being devoted to oyster-cultural problems on a small commercial scale. Three creeks have been reserved by the State Board of Fisheries for Bureau use in experimental oyster farming, but present facilities are sufficient for operating only one.

During this first year emphasis has been placed on seed production. As a means of standardizing results, cultch material consisted exclusively of 60,000 bushels of clean oyster shells, made available from a local cannery, which were planted for catching spat and hardening the bottom.

Toward the end of the year 5 mud and shell dams were constructed to impound an area of about 25 acres of marsh, 5 acres of which are being utilized for growth studies of seed oysters. One thousand bushels of seed from the 1939 stock have been transplanted to this location.

Briefly summarized, the first year's work has provided data on the following subjects: (1) Daily hydrographic observations were made of the bottom water temperature, salinity, pH, and turbidity. (2) Although the water temperature reached 20.0° C. by the end of March, the oyster-setting season was observed to extend from the end of May to the first of November. Shell-bag collectors were found to be unsuitable for local waters due to the very slow rate of spat attachment. (3) The rate of growth of spat was determined during their first 6 months by measuring samples twice a month. A few early spat had reached 3 in. in length at the end of 6 months. (4) The relative value of various types of bottom for collecting seed was shown by actual production. A total of about 4,000 bushels of seed oysters was produced on the experimental area in Horse Pen Creek this year. (5) The existing belief that setting of oysters in South Carolina waters occurs only between tide lines was disproved. Oyster larvae readily set below low-water mark if clean cultch is provided. However, less than 10 percent of spat survive as long as 6 weeks at such depths.

*Gulf of Mexico.*—Oyster production on the Gulf coast has been at a low level for a number of years, and markets have found it necessary or advantageous to import oysters from the Middle Atlantic coast to satisfy the demand. Almost all of the oysters harvested on the Gulf coast, with the exception of those produced on private grounds, chiefly in Louisiana, are taken from natural oyster bars, or reefs, which have been built up by the slow accretion of centuries. Otherwise, little private oyster culture is practiced, although the various States attempt to maintain the natural oyster bars by extensive planting of cultch and seed.

The following difficulties are faced by State organizations in their attempts to maintain a large, dependable production of oysters: (1) More oysters are harvested than the grounds should produce, with the result that the size as well as the quantity harvested has been reduced. (2) There frequently is considerable mortality due to freshets, or periods of very low salinity in oyster-producing bays, caused by heavy rains or melting snow inland. (3) Some mortality caused by predators or parasites, such as conchs, sporozoans, and other organisms. (4) The effect of such nonparasitic organisms as the boring clam (*Martesia*), which inhabits the shells of oysters, is not yet known but will be determined.

In order to solve some of the most serious problems of the oyster industry on the Gulf coast, the Bureau of Fisheries established a permanent laboratory near Pensacola, Fla., in 1937. For this purpose the Bureau took possession of the abandoned Pensacola Quarantine Station and adapted it to the needs of the shellfish investigations, with the aid of W. P. A. funds. Construction work at the station is expected to completed during 1940.

In carrying out scientific investigations, Dr. A. E. Hopkins, director of the station, has cooperated extensively with oystermen and with conservation departments of the Gulf Coast States in formulating programs for the development and maintenance of natural oyster grounds, and the creation of new grounds, by planting seed and shells. In Florida, especially, much progress has been made in projects of this kind with the assistance of the W. P. A. During the year, surveys were made of the oyster grounds of Mobile Bay, Ala., and connected waters, and cooperation was given to the Alabama Department of Conservation in promulgating regulations designed to restore the grounds to their former productivity.

An experimental study was planned to obtain exact data on the effect of variations in salinity on oysters. However, the work has been deferred pending completion of large outdoor concrete tanks where the experiments can be carried on under controlled conditions. Observations were made during the summer in East Pensacola Bay, where there was a large mortality during a period of low salinity. Counts of live oysters and the intact shells of those that had died recently showed a mortality of 90.3 percent. The mortality was difficult to understand, since the freshet condition lasted only about 3 weeks, and since the oyster grounds are so located that they are supplied with salt water from the Gulf at high tide. A study of the data available indicates that the mortality was the result of a combination of factors, one of which was low salinity. The oysters had been heavily infested with a sporozoan parasite, *Nematopsis ostrearum*, which appeared to render the oysters less resistant to handling or transplanting. Also, the period of low salinity occurred in August, immediately after the oysters had completely spawned out and their resistance was greatly lowered. It is probable that low salinity decreases the feeding activities of *Ostrea virginica*. Dr. Hopkins found the same relationship between reduced feeding activity and low salinity in *Ostrea gigas*. The problem of the effect of salinity on oysters will be thoroughly studied as soon as possible.

## RESPIRATION OF THE OYSTER

During past years considerable information has been accumulated by the Bureau's investigators regarding the nutritive value of oysters from different sections of the coast, and regarding the seasonal fluctuations in the mineral, water, and glycogen content of oysters in Long Island Sound. There is no doubt that the good qualities of marketable oysters are determined by a high percentage of solids, high glycogen content, and the presence of sufficient amounts of metals such as calcium, iron, copper, and iodine—important in a well-balanced human diet. The importance of producing oysters of highest nutritive value is now being recognized by the majority of the leading oyster growers. The difficulty lies, however, in the fact that present observational data provide no clue to the methods or procedures by which oysters of desired qualities could be produced. Practical solution of this problem rests on fundamental knowledge of the carbohydrate and metal metabolism of the oyster. Since all the activities of an organism, in the final analysis, depend on respiration, the study of the gaseous exchange of the oyster was expected to throw light on other features of its metabolism. During the summer of 1939, experiments along this line were carried out at Woods Hole by Dr. Galtsoff, with the assistance of George Mishtowt. The purpose of the experiments was to determine whether the increased iron content had any effect on the rate of respiration. Oysters, poor in iron, were kept in water with high iron content until a great deal of the metal had been assimilated in the animal tissues. The rates of oxygen consumption of these oysters before and at the end of the experiments were determined and compared.

The excess of iron in the tissues seems to slightly increase the oxygen consumption, although the results of the summer's experiments are complicated by the change in the organisms caused by spawning. There was a general decrease in the oxygen consumption after spawning which amounted to 22 percent in the control oysters, while in the "iron fed" oysters it averaged only 19.4 percent There was an apparently significant difference between the change of the metabolic rates of the male and female oysters, which is probably determined by their sex. In both sexes the lowest metabolic rate was found to occur during the after-spawning period, which is characterized by the poorest condition of the oyster meat. It is planned to continue this investigation by carying out tests during the various seasons of the year.

### OYSTER PESTS AND PARASITES

In addition to the starfish and oyster drill, which devour large numbers of newly set oysters, two other molluscs, namely, *Anomia* and *Crepidula*, were found to be responsible for the mortality among spat in the Long Island area. As a rule, the setting of *Anomia* and *Crepidula* occur almost simultaneously with the setting of oysters. However, because of the much lower rate of growth of oysters, *Anomia* or *Crepidula* soon suffocate the spat by covering it with their shells.

However, heavy mortality among oyster spat cannot be attributed soley to their enemies such as starfish, drills, *Anomia* and *Crepidula*. The oyster set died in some areas where these enemies were not numerous enough to inflict heavy losses. It is quite probable that in some areas of Long Island Sound the mortality of spat was due to a disease or infestation by some unknown parasite.

*Starfish setting.*—The first setting of starfish in 1939 took place in Long Island Sound between July 13 and 17, and continued until September 11 with two distinct peaks in the intensity, the first between July 20 and 24, and the second between July 31 and August 3. The heaviest setting took place at the stations located at 30- and 40-foot depths. The numbers of starfish that set in 1939 were small, and even at the height of setting the young starfish rarely averaged two per shell. However, because of a very high rate of survival among recently set starfish, and because of their rapid growth, they soon became a serious menace.

*Distribution of starfish.*—In accordance with the practice established last year, semiannual surveys of the distribution of adult starfish in Long Island Sound were made in March and November. As compared with the conditions existing in November 1938, the density of the starfish population in different areas of the Sound in March 1939 remained virtually the same. In general, starfish were rather scarce or entirely absent. Even in the most heavily infested area between Charles Island and Stratford Point they did not exceed 77 per sample. The majority of the samples contained from 1 to 5 starfish only. The second survey, made in November, revealed a tremendous increase in the starfish population throughout the entire growing section. From 25 to 100 times as many were found in November as were found in March. The majority of starfish were of the 1939 set. The large increase in the numbers of starfish compelled the oystermen to carry on a vigorous campaign of eradication. A new method, consisting of spreading lime over the infested areas, was put into general use and proved to be quite satisfactory. At present this method is being relied upon by many oyster-growing companies operating in Connecticut, New York, and Rhode Island waters.

*Oyster drill.*—During the last few years the common oyster drill (*Urosalpinx cinerea*) has become very numerous in the waters of Long Island Sound, where it destroys large numbers of oysters. Experiments conducted at Milford Laboratory by Mr. Engle showed that the period of feeding lasted from late May until late November in 1939, with the peak of activity between the middle of August and the middle of September. The voracity of drills was observed under laboratory conditions. Several young *Urosalpinx*, less than 30 days old and about 2 mm. long, were put in an aquarium with oyster spat ranging from 2 to 4 mm. in diameter. Within 15 days 2 drills destroyed 142 oysters. The deposition of drill egg cases began early in June, when the water temperature was about 16.0° C. (60.8° F.), and continued through October. The heaviest egg case laying occurred from the middle of July through the middle of August.

*Boring clam.*—Another problem which has been attacked by the staff of the Pensacola Laboratory is the boring clam, *Martesia*, which is common on many parts of the Gulf coast. This clam apparently enters the shell wall at a small size and enlarges the cavity it occupies as it grows larger. Nothing is known of its life history at yet, save that it is a lamellibranch, and presumably has a free-swimming larval stage. In Mississippi Sound, near Biloxi and Gulfport, the infestation has begun to assume serious proportions. Fifteen years ago Dr. Galtsoff, after a through survey, reported no boring clams in that region. Oystermen claim that they have appeared only in the last few years, and now, on some grounds, living oysters are so infested with the clams that the shells crumble under slight pressure. It is not unusual for an oyster about 3 inches long to have 100 or more boring clams occupying each of its valves. As the clams grow to about one-fourth inch in diameter they consume the shell, leaving little protection for the oyster living within. An investigation of the life history of the boring clam, its habits and tolerance of environmental factors, has been undertaken at the Pensacola Station.

*Sporozoan parasite.*—A long-continued investigation of the sporozoan parasite of the oyster carried on by Dr. Prytherch at Beaufort, N. C., has been completed. A detailed description of the development and microscopic structure of this pest is incorporated in the manuscript entitled "The life cycle and morphology of *Nematopsis ostrearum*, sp.

nov., a gregarine parasite of the mud crab" (to appear in the Journal of Morphology). A report is in preparation on the other phases of this work dealing with field observations of oyster mortalities in Southern waters, and the effect of the parasite on the functioning of the adductor muscle of the oyster.

### EFFECT OF PULP-MILL POLLUTION ON OYSTERS

The York River Investigations, carried on by Dr. Walter A. Chipman, Jr., and Dr. H. N. Calderwood, have been concerned with the continued search for the chemical or chemicals present in the effluents from pulp mills that cause changes in the physiology of oysters. This information is of importance in the problem of eliminating pulp-mill pollution. Progress has been made in the elimination of some fractions as causative agents, and in acquiring some knowledge as to the nature of these physiologically active materials. The investigations have not as yet progressed to a point where the actual causative agents can be definitely identified. As during the previous year, the work has been carried out in cooperation with the Virginia Commission of Fisheries, through an allotment of funds. Additional laboratory and office space were provided free of charge by the College of William and Mary.

Studies made prior to 1939 showed that effluents that enter the York River from the pulp and paper mill at West Point are effective in reducing the rate at which water is pumped by oysters. It has also been shown that the effluent that has the most active physiological effect arises from the making of pulp, and contains cooking liquor, weak black liquor, soaps, and foam, in addition to the wash waters. The work during 1939 demonstrated that the physiological activity of sulfate soap has been due to the black liquor it contained, and that the foam is no more than a mixture of soaps and black liquor. Samples of black liquor from which the soaps had been removed still maintained their potency. Consequently, the work has been directed towards fractionation of weak black liquor. The physiologically active material of the weak black liquor has been separated through procedures involving precipitation, extraction, and selective solution.

Chemical investigations on weak black liquor samples are being continued, with the object of discovering whether or not there is any correlation between the alkalinity and volatile sulfide content and the variations in the effect of these samples on oysters. It is hoped that the further fractionation of the weak black liquor and the analytical analyses of these fractions will supply definite information on the chemical nature of the physiologically active material, and thus allow steps to be taken leading to elimination of this type of pollution.

A small group of studies were made this year at the request of the Naval Mine Depot at Yorktown, Va., to ascertain whether or not wash waters resulting from the purification of stored TNT would be harmful to oysters and clams if emptied into the York River. As a result of the tests made it was found that no harmful effects could be expected at the dilutions to be discharged.

## SPONGE-FISHERY INVESTIGATIONS

DR. PAUL S. GALTSOFF, *in charge*

Early in December, 1938, a heavy mortality broke out among the commercial species of sponge (wool, velvet, grass, reef, yellow, and hardhead) on the natural banks in the waters of the Bahama Islands. At the request of the Colonial Secretary of the Bahamas, and with the consent of the U. S. Department of State, Dr. Galtsoff was detailed to Nassau, Bahamas, to collaborate with the British Department of Sponge Fisheries in conducting the necessary investigation of the cause of the mortality. This detail, which involved no expenditures on the part of the Government, continued from February 15 to April 7, 1939. During this brief period extensive hydrographical, chemical, and biological observations were made in the area of greatest mortality, near Andros Island, with additional observations on the Little Bahamas Bank and in the inshore waters around New Province Island. Laboratory and field experiments were conducted at the same time at Nassau and the field station at Mastic Cay, Andros Island. The records of a spread of mortality over the natural and cultivated sponge beds of the Islands indicate that the sequence of infection was from east to west, following the trend of water movements within this area. Determinations of salinity, pH, dissolved oxygen, excess base, calcium, and analyses for phosphates, silicates, and heavy metals failed to disclose any factor which may have been responsible for the mortality. Microscopical examination revealed, however, the presence of fungal filaments in all diseased sponges. These filaments have not been found in healthy sponge tissues, nor in the remains of sponges which have been long dead. They are particularly abundant in the marginal zone between the newly dead and living tissues of diseased sponges. The infection spreads gradually through the tissues, starting often from an origin inside.

In the experiments conducted at Nassau, and at Mastic Cay, it was possible to infect reef and wool sponges with the fungus by contact with fragments of infected sponges of the same species. The fungus was tentatively identified as *Spongiophaga* sp. By the end of February the disease had spread to the northern coast of Cuba, and in March it was reported to have reached Key West, Fla.

A survey of the conditions of the Florida sponge fishery was made by Dr. Galtsoff immediately upon his return from the Bahamas. It was reported that during the first week of March large numbers of wool, yellow, and grass sponges were noticed on the reef extending along the Atlantic side of the Florida Keys. In a short time similar conditions were observed from Key West to Biscayne Bay. The mortality occurred almost simultaneously in Florida Bay, Barnes Sound, and Biscayne Bay, apparently spreading through the numerous passages which intersect the Keys and connect the waters of the Atlantic with those of the Gulf. Gradually the epidemic progressed westward over the entire area of Florida Bay as far as Cape Sable. Reports of the destruction of sponges in this region were received about the middle of April. At that time the mortality among commercial sponges reached such proportions that fishing became unprofitable, and had to be stopped long before the end of the season.

which usually lasts until August. It has been estimated that between 60 and 70 percent of the sheepswool sponges were destroyed and that yellow and grass sponges were almost completely wiped out. Reports from Cape Sable estimated about 80 percent mortality of sheepswool sponges.

Chemical and biological investigations established the striking similarity between the conditions found in the Bahamas and in the Key West area. There was nothing abnormal in the composition of sea water, plankton, and microplankton. On the other hand, microscopic examination of the diseased sponges showed the presence of a fungus morphologically identical with the microorganism found in the dying sponges of the West Indies.

During the spring, fishing in the Tarpon Springs area continued normally. None of the divers interviewed at that time reported any unusual conditions on sponge grounds. Rumors were persistent, however, of the presence of diseased sponges on some of the bars in the northeastern corner of the Gulf. Finally, one diver reported the presence of a large number of diseased sponges on the bars between Cedar Keys and Carabelle. Through the courtesy of Captain Maurice Gay, who offered free of charge the facilities of his boat, diving equipment, and the services of his crew, a survey was made of the affected area. Diseased sponges were found on the bars off Carabelle at the depths between 5 and 6 fathoms. The infection was light, however, and resulted only in a partial destruction of the sponge body. At the time of the investigation there was no pronounced mortality among these sponges. Because of lack of funds for sponge investigations field studies were discontinued, but arrangements were made with Captain Gay and the Florida Department of Conservation for collecting and preserving additional diseased sponges which were forwarded to the Woods Hole and Washington laboratories for microscopical examination. Throughout the summer and fall samples of diseased wool sponges were studied. A high percentage of them were found to be infected by fungus. In the meantime, reports received in the Washington office indicated the spread of the disease to the Tarpon Springs area. Increased mortality of commercial sponges on all deep-water grounds become so pronounced that in December fishing on bars situated below 8 fathoms was discontinued, and an unusually large number of sponge boats concentrated in a comparatively shallow area off Cedar Keys. At the end of the year, the number of sponges brought to the Tarpon Springs Sponge Exchange noticeably diminished, and the sponge fishermen and dealers were greatly concerned regarding their only means of livelihood. The future of this unique and highly specialized industry appears to be quite dark. Comprehensive plans for investigation and conservation of valuable sponge fishery resources have been prepared. Their execution depends, however, on the appropriation of necessary funds.

## AQUICULTURAL INVESTIGATIONS

Dr. H. S. Davis, *in charge*

The ever-increasing popularity of sport fishing has resulted in increased demands on our lakes and streams which can only be met by the development of scientific methods of fish conservation and management. While there is a limit to the production of fish in any body of water, it is probable that, in many cases at least, the yield of game fish can be materially increased. Investigations have shown that present methods of stocking and other practices often fail to produce the results expected, and it is evident that much remains to be done before fish management can be established on a sound basis.

These problems are being attacked along three principal lines. One deals primarily with the artificial propagation and rearing of game fishes; a second with the parasites and diseases of fish, especially those prevalent at hatcheries and which frequently seriously curtail the output; and a third line of investigation is concerned with field problems relating to fish management, such as comparative survival and growth of hatchery and wild fish under natural conditions, the ecological requirements of different species of game and food fishes, and the possibility of increasing fish production in natural waters.

In the interest of greater efficiency, the headquarters of the Aquicultural Investigations was moved to the experimental hatchery at Leetown (P. O. Kearneysville), W. Va., in the spring of 1939. This station, operated primarily for experimental work with both trout and warm-water fishes, also has adequate laboratory facilities, and hence affords an excellent opportunity for studies related to hatchery operations.

### TROUT

Investigations on trout have been concerned chiefly with field studies of the results of artificial stocking and other problems related to fish management, with the development of cheaper and better diets for hatchery fish, and with selective breeding for the purpose of developing strains that are superior to those ordinarily found at hatcheries.

*Feeding experiments.*—Feeding experiments were continued at the Leetown Station by Dr. J. S. Gutsell. These experiments were designed primarily to develop better methods of feeding animal meals, since previous work had shown that these products, when combined with fresh meat, make an excellent and economical diet for trout. It was found that under ordinary conditions it is not advisable to use more than 50 percent dry meal in the diet. While trout can subsist on diets containing considerably larger amounts of meals, the meals are utilized less efficiently and there is considerably more waste in feeding. The rate of growth of trout on those diets is materially increased by the addition of small amounts of either cod-liver oil or kelp meal and is increased still further if both are included in the diet.

Experiments designed to show the effect of food on the quality of trout eggs have confirmed the belief of many fish-culturists that overfeeding is distinctly detrimental, since a larger percentage of the eggs fail to hatch. To produce eggs with the greatest hatchability, at the lowest cost, the fish should be fed a well-balanced diet in moderate amounts.

Experiments at Leetown, and at Hackettstown, N. J., in cooperation with the New Jersey Fish and Game Commission, have shown conclusively that frozen fish, when fed continuously in considerable quantities, produce definite toxic effects. The trout become dark colored and eventually die.

Feeding and nutrition experiments conducted at the cooperative hatchery at Cortland, N. Y., are discussed in a separate section of this report.

*Selective breeding.*—Breeding experiments with brook trout were continued at the Pittsford (Vt.) Hatchery and have resulted in more than doubling the rate of growth and also the production of eggs. Strains of fish also have been developed that are more resistant to hatchery diseases, especially furunculosis.

Breeding experiments with rainbow trout are being carried on at the Leetown Station, but have not yet been continued long enough to produce significant results.

### WARM-WATER FISHES

Studies on the black basses and other warm-water fishes are being conducted at the Leetown and Welaka (Fla.) stations. Hatchery and field investigations were carried on at both stations, but at Leetown the smallmouth black bass received most attention, while at Welaka the largemouth black bass was the center of interest.

*Studies at Leetown.*—The work on smallmouth bass streams in this region, under the direction of E. W. Surber, was confined to (1), the collection of 100 adult smallmouth black bass for food and parasite studies from each of the following streams: Cacapon River, South Branch of the Potomac River, and the Shenandoah River; and (2), the collection of temperature and turbidity records in the Shenandoah River.

Previous studies on the spawning of smallmouth bass in these streams have shown that large numbers are hatched each year, but that the number of young bass decreases rapidly a short time after they leave the nest. The loss is probably greater than in hatchery ponds under ordinary conditions. A large part of this loss in streams is believed to be due to predacious fish, especially young smallmouth bass in their second and third year of life. Some of the loss appears to be caused by parasitization.

Experimental work at Leetown has been limited, due to lack of suitable ponds. However, 28 new ponds, designed especially for experimental work, were completed during the past year and will be available for use in 1940. Some experiments with forage fish, carried on during 1939, demonstrated that when ponds are stocked heavily with black-head minnows before smallmouth bass fry are added, large numbers of fry disappear, presumably because they are eaten by the minnows. Largemouth bass fry, however, have a better chance of survival. The results indicate that 1,000 to 3,000 black-head minnows per acre can be used successfully if ponds are not stocked with minnows until the bass fry are too large to be eaten.

*Studies at Welaka.*—The work at this station is under the direction of O. Lloyd Meehean. During the season 1939 only 8 ponds were available for experiments, and were fertilized with cottonseed meal at weekly intervals. Four ponds were stocked with bream (bluegills) and golden shiners to serve as forage, and the remaining 4 ponds were stocked with largemouth black bass only. The ponds that contained forage fish produced an average of 5,120 largemouth bass fingerlings per acre. The results, however, varied greatly in the different ponds, and indicate that much is still to be learned concerning the ecology of ponds that contain forage fish. In ponds where fertilizer alone was used the yield of bass fingerlings was much more uniform, with an average yield of 11,390 per acre.

In previous experiments in other localities Mr. Meehean found that in fertilized ponds, without forage fish, no matter how heavily the pond may be fertilized, the bass grow rapidly until they reach a length of 2.5 to 3 in., when growth practically stops. It was thought that if sufficient forage fish were present the bass fingerlings would continue to grow throughout the season, but this was not true. Growth was arrested at approximately the same time regardless of whether or not the ponds contained forage fish.

The largemouth black bass fry grew to a length of 2.5 in. in approximately 2 months. One pond was then drained and stocked a second time with largemouth bass fry, and yielded a total production of 19,047 2.5-in. fingerlings per acre for the season. After removal of the largemouth bass fingerlings the pond was stocked with bream (bluegills), which yielded 47,179 1.5-in. fingerlings per acre when drained in the fall. The total yield of this pond for the season was 66,227 largemouth bass and bream fingerlings, which is believed to be a record.

### FIELD STUDIES

Fish management studies on trout waters were carried on at the Pittsford (Vt.) and Leetown (W. Va.) Stations, in the Pisgah Game Preserve in North Carolina, and in Utah, Idaho, and California.

*Test waters.*—The field work at the Pittsford Station, under R. F. Lord, has been confined to the so-called "test waters," which have been operated in cooperation with the Vermont Fish and Game Service. This work was begun in 1935 on Furnace Brook. The following year two more streams and Chittenden Reservoir were included in the program, increasing the number of test waters to four, the maximum number allowed by law. However, in 1939, two of the streams were discontinued as test waters and observations were made only on Furnace Brook and Chittenden Reservoir.

The total catch on Furnace Brook for the season of 1939 consisted of 1,321 brook trout and 1,676 rainbow trout, a total of 2,997 fish, as compared with a total catch of 4,647 in 1938. This was the lowest catch recorded since the study began, and was probably due, in large part at least, to the severe flood of September 1938, which did great damage to Vermont streams. It is interesting to note, however, that, as in 1938, the catch of rainbow trout exceeded that of brook trout, even though no rainbow trout have been planted in the stream for years, while it receives a heavy stocking of brook trout annually.

Artificial stocking appears to have given better results in Chittenden Reservoir, although the results are by no means conclusive, due to incomplete data. However, fishing in this lake has improved greatly since it has been stocked annually with large rainbow trout. An accurate count of marked fish captured by anglers was made on only a few days, and 27.5 percent of the fish taken were hatchery reared. It is noteworthy that one-third of the marked fish were planted in 1937, the remaining two-thirds in 1938.

*St. Mary River.*—On the basis of observations made on the St. Mary River by Mr. Surber, from 1935 to 1939, it was concluded that the stream is well-suited to trout, so far as temperature and other physical and chemical conditions are concerned. The stream is rather poor in food, however, and an examination of the stomachs of 51 brook trout and rainbow trout showed a numerical predominance of terrestrial over aquatic insects. This was especially true of the brook trout. Rainbow trout consumed considerably greater numbers of aquatic forms, as well as considerable quantities of algae. Artificial stocking with brook and rainbow trout has had little effect on the fishing. Of 11,107 marked trout planted since 1935, only 268 or 2.4 percent have been recoved. The observations also revealed a very slow growth rate of stocked fish; a marked downstream migration of rainbow trout; an increase in the populations of both brook and rainbow trout due to natural propagation; and a gradual decrease in the numbers of planted rainbow and brook trout.

It is planned to continue the work on this stream during the coming year, and it has already been stocked with marked brook and rainbow trout fingerlings. North Creek, a stream of quite different type, also will be placed on an experimental basis next year. This stream is believed to provide much better conditions for trout, and will afford an excellent opportunity to determine whether or not rainbow trout will show a greater tendency to remain where planted when the environment is more suitable.

*Pisgah Game Preserve.*—The United States Forest Service has complete control of the wildlife on the Pisgah Game Preserve, and consequently the streams of this area afford an exceptional opportunity for experiments in fish management and for a demonstration of what can be accomplished by scientific methods. That the management program, under the direction of T. K. Chamberlain, is producing results is indicated by the fact that in 1939 it was possible to accommodate more anglers and permit a longer season than in previous years. In spite of the increases in total fishing intensity, the number of fish caught per angler was practically the same in 2 successive years, 4.8 in 1939, as compared with 4.9 in 1938. A cursory examination of the streams after the fishing season had closed indicated that many of them could have been fished more intensively without danger of depletion. In fact, some streams apparently are in danger of becoming overpopulated with trout, and therefore it is proposed to allow a material increase in the amount of fishing during 1940.

Since anglers are required to have their catches examined at checking stations, complete data are obtained on the species, size, and markings of all fish caught. However, no information can be obtained from this source concerning the migrations of fish within a particular drainage, or of trout below legal size. This, and other information which is not obtainable from an examination of anglers' creels, are essential for successful fish management. The required information can be procured most satisfactorily by sampling the fish population, but it is practically impossible to use a seine in the average trout stream. In an attempt to work out a satisfactory method for sampling our streams, the chemical method of conducting a fish census is being investigated.

*Lake management studies in Ocala National Forest.*—Field studies in Florida have been confined largely to the Ocala National Forest which affords exceptional opportunities for the investigation of lake-management problems, since there are a large number of lakes that may be opened or closed to fishing as necessity dictates. Surveys of these lakes have been carried out in cooperation with the Forest Service. A stocking program based on these surveys was initiated in the fall of 1939, under which all the important lakes within the area will be adequately stocked.

Certain immediate objectives have been set up for study and a group of 11 lakes has been set aside by the Forest Service, with the consent of the Florida Commission of Game and Fresh Water Fish. A second group of 8 lakes was closed to fishing in 1939 for the purpose of determining the fishing load which lakes of various food grades may be able to maintain with or without a stocking program.

In the study of fish populations it is planned to kill and examine fish of various food grades in lakes which have already been closed for scientific study. The value of this information lies in its application to all of the lakes in the area, and a more intelligent evaluation of their crop capacity.

*Intermountain Region.*—The work in this region is under the direction of Dr. Stillman Wright, who has devoted much of his time to an investigation of Bear Lake. This lake, which is situated almost equally in Utah and Idaho, at one time supported a large population of native trout. Marked depletion of the stock was noted as early as 1884, and presumably the decline has continued up to the present time. At a meeting of representatives of interested agencies at Pocatello, Idaho, in March 1939, it was agreed that each State would contribute $600 to aid the Bureau in a biological survey of the lake to serve as a basis for a management plan. This amount was later increased to $800 and 2 biologists spent the summer on the lake. The survey is being continued during the winter months by occasional visits to the lake, and will be carried on intensively during the summer of 1940, each State having contributed $920 for the purpose.

The Bureau has continued to cooperate with the Utah Game Commission in the control of undesirable species of fish in Fish Lake. This lake is probably one of the most productive in the country, but recently there has been a marked decrease in the catch, especially of brook trout. It was thought that an important factor in the depletion might be the increased abundance of the Utah chub. Accordingly, great numbers of these fish were killed with rotenone (derris root). There is evidence that the condition of the brook trout improved following the reduction of the chub population in Fish Lake, and this fact is believed to justify a continuation of the program of chub control.

While most of Dr. Wright's activities were concerned with the Bear Lake and Fish Lake projects, some attention was given to a number of minor problems. An inquiry was made into the cause of an extensive mortality of whitefish in Lake Pend d'Orielle, Idaho, and 1 week was spent in Colorado investigating a number of fishery problems.

## CALIFORNIA TROUT AND SALMON INVESTIGATIONS

The management problems now being investigated, under the direction of Dr. P. R. Needham, include three major phases: (1) Cooperative stream and lake surveys and catch record work with the United States Forest Service in California and Oregon; (2), operation of the Convict Creek experimental stream, near Bishop, Calif.; and (3), studies of salmon that will be prevented from migrating to their spawning grounds on the upper Sacramento River because of the Shasta Dam.

Cooperation with the Forest Service was curtailed, owing to lack of funds. However, stream and lake surveys were carried on in the Mount Hood and Fremont National Forests in Oregon, and the Whitman National Forest in Washington. Complete catch records were secured for a third angling season on Squaw Creek, in the Shasta National Forest, California. A report covering 3 seasons' work on this stream is now in preparation.

*Mexican trout.*—A second trip was made to Lower California to secure *Salmo nelsoni* to replace the first lot lost during the flood in March 1938. These trout, inhabiting the warm and isolated Rio Santo Domingo, were secured to try and develop a stock which will be tolerant of warm water and nonmigratory. The trip was highly successful, and 325 fingerlings between 2 and 4 inches long were transported by truck to the experimental stream near Bishop, without the loss of a single fish. Later they were transferred to the Clarkamas Hatchery, near Portland, Oreg.

*Convict Creek experimental stream.*—The season's work was begun on April 25. Construction of the large cabin begun in 1938 was completed, and a diversion ditch was excavated around the experimental area to by-pass excess water during spring floods.

Studies were again concerned with the problem of the survival of trout after planting. Winter conditions in this region permit only seasonal operation. In the season of 1937 the planting experiments were operated for a period of approximately 75 days; in 1938 this was extended to 90 days; and, in 1939, to 107 days.

A new experimental section over 800 feet in length was made available by the construction of a concrete flume screened at the upper and lower ends. All wild fish were removed from the section which was then stocked with 1.4-in. Loch Leven trout. The survival after 107 days was 87 percent, and the average length 2.64 in. In general, survival rates in 1939 were less than in 1938, which is surprising in view of the fact that the number of wild fish competing with the planted fish was greater in 1938. Survival records for 3 years have now been accumulated, but owing to limited personnel a thorough analysis of the data has been impossible.

A population study was made in two series of pools in Convict Creek—one below the experimental area in open waters, and one within the area where no fishing is permitted. It was found that the section open to angling contained 3.8 trout, 6 in. long, per pool, while in the closed section there were 14.5 trout per pool. While pools in the section open to angling contained fewer large trout, they contained larger numbers of fish of the younger age-groups than pools in the closed section. It is interesting that such a short closed section (less than one-half mile) protects the large fish. Evidently they did not exhibit much movement during the summer.

*Shasta Dam studies.*—Surveys to determine the most feasible means of salvaging chinook salmon whose migration will be blocked by the Shasta Dam were continued on funds provided by the Bureau of Reclamation. These surveys showed that none of the tributaries of the Sacramento River below the dam site afford either spawning areas or suitable water for transference of the salmon.

In order to provide a suitable stream to which the salmon runs can be transferred, it is proposed to bring water by flume from the McCloud River to Stillwater Creek, and thus provide a permanent flow into this stream. Stillwater Creek rises in the foothills on the southern edge of the future reservoir and flows south about 24 miles to join the Sacramento River south of Redding. At present this stream has an intermittent flow and is dry during part of the summer and fall. Nevertheless, chinook salmon spawn in it naturally, and its gravel bed should provide excellent spawning grounds if a permanent flow is provided. The plan also includes a hatchery, with holding and rearing ponds, at the head of Stillwater Creek.

Counts of adult salmon that passed over the dam at Redding were continued during 1939. Between April 17 and December 9 a total of 21,897 chinook salmon were recorded. These counts do not include fish that ran in late fall, winter, or early spring, and it is estimated that the total run now passing the site of Shasta Dam is approximately 25,000 fish. A preliminary report on the entire Shasta Dam salvage problem is in preparation and will be completed early in 1940.

## PARASITES AND DISEASES OF FISH

Increased facilities for pathological work at Seattle, Wash., have enabled Dr. Frederic F. Fish to carry on his work to much better advantage. His most important contribution during 1939 was the discovery that formalin is a most effective agent for the control of the external parasites of fish. In the formalin treatment, fish-culturists now have at their disposal a safe, practical, and economical method of eliminating ectoparasitic protozoans, and possibly other parasites as well. Heretofore the great limitation to prolonged treatments has been the lack of a disinfectant possessing a sufficiently large factor of safety between effective and lethal concentrations. Comparative tests with a protozoan parasite (*Trichodina* sp.) showed conclusively that formalin was far more effective than any other disinfectant used. Exposure of heavily infected fish to a 1:4,000 solution of formalin for 60 minutes resulted in complete elimination of the parasite, without injury to the fish.

However, prolonged treatments in the standing water of a fish pond, although simple, effective, and cheap, involves oxygen depletion and the accumulation of carbon dioxide. A comprehensive investigation of this problem is now under way, the ultimate objective being the preparation of a series of tables giving the time required to exhaust the dissolved oxygen to an arbitrary level of 4 p. p. m. under all normal hatchery conditions.

A second major investigation was the study of an epidemic of *Costia necatrix* at the Bureau's hatchery at Birdsview, Wash., in cooperation with the Division of Fish Culture. These studies indicate that *Costia* may be a foreruner, and probably a direct cause, of the Western type of gill disease. It is believed, however, that *Costia* is not the sole cause of this type of gill disease, which presumably may result from any prolonged irritation of the gill epithelium. Infection by *Costia* can be prevented by weekly treatments with a 1:6,000 solution of formalin.

During the past year an effort was made to place the losses that occur at the Bureau's trout hatcheries on an accurate statistical basis. Records, based insofar as possible upon actual counts of 288 lots of fish at 22 separate hatcheries, were analyzed for the percentage loss occurring among progressive size groups at half-inch intervals. The average loss between the eggs and 4-inch fingerlings was approximately 50 percent, which is much less than is believed to occur in nature. These results further emphasized the importance of hatchery losses and the need for more investigations of their causes. In 102 lots of fish, where both food and mortality records were available, it was found that the cost of food fed to these fish was $5,722. The economic value of the dead fish among the 102 lots was conservatively estimated at $35 817.

Several investigations of losses of fish at hatcheries in the general vicinity of Seattle, and losses among wild fish in the field, were made by Dr. Fish. Of the latter, losses among silver salmon, which apparently were caused by excessive sunshine, and attacks by fungus (*Saprolegnia*), which inflicted serious losses among adult chinook salmon and steelhead trout liberated in the Entiat River in the Columbia River salvage operations at Rock Island, were most noteworthy.

At the Leetown Station, George E. Klak made a study of a strigeid worm which is very abundant in the black-head minnows. He found that these worms caused sterility when their number was in excess of 1,000 per fish. In some cases they occurred in such numbers as to rupture the abdominal wall.

Dr. Davis continued his studies on a suctorian parasite of the smallmouth black bass. This parasite occurs on the gills, and when very abundant may seriously injure the host and eventually cause its death. It does not affect the largemouth bass, even when in the same pond with heavily infected smallmouth bass.

Studies are also being carried on at Leetown on the common bacterial gill disease of trout. It has been found that this disease may also affect largemouth and smallmouth black bass and has caused serious mortality among both young and adult fish. Other parasites of bass and trout are being studied for the purpose of clearing up certain points in their life history and developing better methods of control.

The disease service, which was inaugurated 4 years ago to assist fish-culturists in the control of hatchery diseases, continued to be heavily patronized during the past year. This service has proved to be very popular and has been an important factor in reducing losses.

## NUTRITION STUDIES AT THE CORTLAND HATCHERY

The experimental hatchery at Cortland, N. Y., is operated under a cooperative agreement between the New York Conservation Department, Cornell University, and the United States Bureau of Fisheries. The principal members of the staff of the hatchery are C. M. McCay, Cornell University; A. V. Tunison and A. M. Phillips, New York Conservation Department; and C. R. Mitchell and E. O. Rodgers, Bureau of Fisheries. The investigations at Cortland are of two general classifications; the development of feeding mixtures and methods, and studies of the transformation of food within the body of the trout.

*The utilization of carbohydrates.*—The inclusion of carbohydrates, such as sugar and starch, in fish diets provides an opportunity for reducing feeding costs. The greater the percentage of carbohydrate materials that can be used by the fish, the cheaper the diet. If concentrated sources of carbohydrate material are to be used to replace meat proteins, the fish must be able to utilize them in the sugar or starch form in which they are administered. A series of experiments designed to study the rate of digestion and absorption of carbohydrates was conducted. Trout are able to digest and absorb large amounts of sucrose (cane sugar). Coating the sugar with melted tallow reduces the loss in water when fed in a meat mixture and the melted tallow also retards the rate of disappearance of the sucrose from the intestinal tract. The use of tallow introduced a fat complex into the study. The sucrose was administered in gelatine capsules inserted directly into the digestive tract by means of a fine forceps. Brook trout weighing from 6 to 14 g. were used in the studies. The capsule usually is penetrated in about 1 hour and the sugar starts to dissolve in the gastric fluid. When the trout were killed immediately after feeding, from 96 to 100 percent of the sugar was recovered from the digestive tract. At the end of 3 hours the sucrose had disappeared from the capsule entirely.

Sucrose was administered in 10-, 25-, and 50-mg. feedings, placed in capsules. The experiments, in which brook trout were killed at various intervals of from 3 to 72 hours after feeding, showed that the amount of sucrose absorbed was dependent on the amount available in the gastro-intestinal tract. No sucrose was found after 72 hours, indicating that absorption is practically complete by that time.

*Effect of diets on the liver.*—Brook trout fed diets rich in cooked starch, sugar, or dextrin, developed large livers that contained a high percentage of glycogen. Those fed raw starch or cellulose, instead of cooked starch, sugar, or dextrin, developed livers comparable in size and glycogen content to the livers of brook trout fed meat alone. An analysis of the livers of trout fed diets containing various carbohydrates was made in terms of percentage of total body weight constituted by the liver, percentage of dry matter in the liver, percentage of dry protein in the liver, percentage of fat in dry liver and milligrams of glycogen per gram of fresh liver.

*Experiments on staining bones in vitreo.*—In experimental stream studies, and in some nutritional studies, it would be a great aid if fish could be marked by some ingredient introduced into the hatchery diet. Since the staining of bones in the growing fish might be developed into a method of marking large numbers of fish, preliminary experiments were conducted. Madder root in the diet in a proportion of 0.5 part per hundred had produced no results at the end of 12 weeks, when the madder content of the diet was increased to 15 parts per hundred. Then the vertebrae assumed no color but the rib bones became definitely pinkish. At the end of 20 weeks the rib bones retained little color but the mandible had a distinct pink color. Since the size of the bone may have some effect on the absorption of madder, the experiments are to be continued. Purified chemicals and other brands of madder root also will be tried.

*Growth of three strains of brook trout.*—Growth studies were conducted using 3 strains of brook trout, 2 from commercial trout hatcheries and 1 from the Bureau's Craig Brook (Me.) Station. They were fed the same diet, similar amounts of food in terms of percentage of the body weight, and were held in troughs at the same weight per cubic foot of water. Although the fry did not start to feed at the same time, during a period of 32 weeks, the growth curves for each strain were surprisingly similar. The average percentage gain in weight by 4-week periods for the entire duration of the experiment was approximately the same for each population.

*Source of protein as a factor in growth.*—Protein is the most costly nutrient of the diet and may be derived from either plant or animal tissues. Diets were compared that consisted of 50 percent pig spleen, 2 percent salt and raw starch, and various percentages of the following ingredients, individually and in combination: Dried skim milk, cottonseed meal, whitefish meal, and wheat flour middlings. The amounts of the ingredients were so adjusted that in combination with the pig spleen the total protein content of each diet was 29 percent. The greatest and an almost equal percentage gain in weight was obtained by the use of the three diets that contained dried skim milk, whitefish meal, or a combination of the four ingredients, in addition to the pig spleen, salt, and raw starch. The diets that contained cottonseed meal and wheat-flour middlings as the variable source of protein gave results somewhat inferior to the other three diets, but which were practically identical.

*Comparative growth of six groups of trout.*—To improve the technique for conducting feeding experiments, and to determine the probable variability between troughs, similar diets were fed to 6 groups of brook trout during a period of 24 weeks. Only 1 group of the 6 showed a statistically significant difference from the mean growth of all 6 groups. The growth during the first 12 weeks averaged 36 to 39 percent; during the second 12 weeks, 18 to 22 percent; and during the entire 24-week period, 28 to 31 percent.

*Assay method for "Factor H."*—In order to develop an assay method for "Factor H," brook-trout fingerlings were fed a synthetic diet of raw corn starch, dextrin, casein, yeast, mineral mixture, and cod-liver oil for a period of 4 weeks when the accelerated condition of mortality indicated Factor H depletion. The group was divided into 12 lots, and each lot was placed in a separate trough. Three lots were fed the same diet. The various diets contained 10 percent, 15 percent, and 20 percent beef liver in addition to the synthetic diet, and the synthetic diet alone.

After 2 weeks, 40 percent of the fish fed on the synthetic diet alone had died. The remainder were then fed 100 percent beef liver. At the end of 16 weeks the fish on the all-liver diet had stopped drying and had resumed normal growth. The inclusion of only a percentage of beef liver in the diet failed to arrest mortality.

Different results, however, were obtained with each diet. The conclusion was reached that the diet must include in excess of 20 percent fresh meat in order to revive brook trout after they have suffered Factor H depletion.

Factor H depletion was accompanied by a decreased erythrocyte count, and led to the production of severe anemia. The addition of beef liver to the synthetic diet caused an increase in the red-cell content of the blood. A count of red blood cells may provide an indication of the presence of anemia, even before the onset of heavy mortality.

*The effect of diet on condition.*—The condition factor of brook trout, which is an index of the relative heaviness of a fish, in terms of a mathematical expression, increases with the length. Trout of the same size fed on the same diet show little variation in condition. The value of the condition factor showed a positive relationship to the protein content of the diet.

*Protein requirements of trout.*—Experiments conducted by Dr. McCay and associates, in 1931, proved that the protein requirements of trout was 14 percent or slightly higher. The experiments were resumed in 1939 to define more precisely the protein requirements of growing trout. Groups of trout were fed diets that contained 5, 10, 12, and 16 percent protein for 24 weeks. The trout were weighed periodically during the course of the experiment and showed the following average gains in weight for 4-week periods: 5 percent protein, 7 percent gain; 10 percent protein, 17 percent gain; 12 percent protein, 20 percent gain; and 16 percent protein, 29 percent gain. The mortality decreased as the percentage of protein was increased. With a diet containing 5 percent protein, 9 percent was converted into body protein; a 10 percent diet resulted in the conversion of 15 percent; a 12 percent diet gave 17 percent conversion; and a 16 percent protien diet resulted in 22 percent conversion.

*Practical diets.*—Experiments were conducted to test and compare the cost and efficiency of diets for practical use. Mixtures of dry foods bound together with salted spleen were tested. The diet considered most useful consists of equal parts of dried skim milk, cottonseed meal, wheat-flour middlings and fish meal combined with 4 percent of their weight of salt and an equal weight of ground frozen spleen. Diets that contained salmon-egg meal and seal meal produced considerable mortality, accompanied by a slimy condition of the body and a gill disease. Until more is known of the toxicity of salmon-egg meal and seal meal they should not be used in fish diets.

## INVESTIGATIONS IN INTERIOR WATERS

DR. M. M. ELLIS, *in charge*

*Pollution studies.*—The pollution studies of the Bureau have been centered at the University of Missouri, at Columbia, where a generous provision of laboratory space and other facilities has been made. A portion of the investigations has been conducted at a subsidiary laboratory located at Fort Worth, Tex. The pollution problems throughout the United States, both specific and general, are so manifold that their permanent solution necessitates a continuation of a program of laboratory research designed to analyze thoroughly the cause-effect complex that is involved in every type of situation. Because immediate and epidemic situations are frequently of a transient nature, the research program is more concerned with an analysis of the cumulative physiological effects of pollutants related to the fish themselves than with the application of palliatives. The investigational program also attempts to determine the precise agent or agents in pollution situations that are responsible for deleterious effects on the fish populations and their habitat.

Three major lines of investigations organized in 1938 were carried forward in 1939 by the Columbia, Mo., field unit in conjunction with the laboratories at Columbia, and at Fort Worth.

*Analytical studies.*—Waters, muds, and aquatic organisms collected in the field are sent to the central laboratory for detailed analyses, which are carried out by Dr. B. A. Westfall and his assistants. In addition to the materials collected by the staff, in the course of field work, a large number of samples are sent in for examination by the various State agencies.

*Bioassays.*—As during previous years, the specific effects of materials found in waters, muds, and pollutants, on living fish, and other aquatic animals, were determined by the bioassay method. The bioassays of pollutants sent to the Columbia unit, by State authorities and other agencies, have become an important function of the laboratory, and many determinations are constantly in progress.

*Physiological investigations.*—The underlying causes for the actions of the various substances found in natural waters and pollutants on living fish are sought through studies of the physiology of fish conducted under the direct supervision of Dr. Ellis at the Columbia and Fort Worth laboratories. As in 1938, one of the major fields of physiological investigation during 1939 was a study of the effects of various components of larvacides and herbicides on fresh-water fishes, and their associated aquatic food organisms. Because the biochemical and physiological tests necessitate technique of considerable precision, each fish is maintained and studied separately and receives individual feeding and care, frequently for several months. More than 300 fish are constantly under observation at Columbia, and numbers of catfish, bass, and other fishes are under observation as part of this investigation at Fort Worth. These studies have progressed to the point where it is possible to conclude that there is impairment of the growth and nutrition of fishes in waters treated even with small quantities of asenicals and several other materials commonly used as mosquito larvacides. A separate report on this subject has just been presented to the Malaria Control Committee as part of the cooperative program on mosquito-control measures conducted in the T. V. A. area.

Throughout the year physiological studies, with concurrent analyses, have been made on the effects of several substances dangerous to fish life which were found in natural waters in the West in the course of the field investigations, with particular reference to the natural pollution picked up by waters used for irrigation during their passage over fields and through irrigation ditches. Marked concentrations of various mineral salts have been discovered in many return irrigation waters, and the detrimental effects on fishes noted. Through the application of physiological, biochemical, and metabolic methods to the study of fishes from irrigation waters, it has been established that many fish in such waters are definitely below par in general physiological condition and reproductive capacity. Irrigation, therefore, constitutes a major and growing hazard to fish life in many of our Western streams.

Utilizing these same methods, the studies of fishes from streams polluted by mine wastes have demonstrated chronic injuries to fishes resulting from much higher dilutions of the wastes than has heretofore been recognized. A detailed report on the effects of lead, gold, silver, arsenic, zinc, and copper mining is in preparation, based on the data obtained during these studies.

*Summer field surveys.*—During the summer of 1939 intensive studies of stream pollution were made along the Atlantic seaboard, and throughout the greater part of the Western United States, and considerable new information was collected on the nature and effects of polluted waters. Observations were made in the States of North Carolina, South Carolina, Florida, Texas, Arizona, Nevada, California, New Mexico, Oregon, Washington, Idaho, Wyoming, and Montana. Over 9,000 analyses were made in the field and additional material was returned to the laboratory at Columbia, Mo., for further analyses.

Early in the summer Dr. Ellis and a field party continued the field work in the headwaters of the Grand River in Oklahoma, Kansas, and Missouri, relative to the pollution of the Grand River impoundment which is being constructed near Vinita, Okla. This work was completed in the fall and a report submitted to the Grand River Authority, pointing out the hazards of the chatfields and other sources of pollution found in this area.

From Oklahoma the party continued south to Fort Worth for work on the catfish under observation at the Bureau of Fisheries' Fort Worth Station, thence to Medina Lake and Uvalde, Tex., where special studies of bass and Rio Grande perch are in progress.

On completion of this trip the field party visited North Carolina and worked southward through the coastwise streams to Florida for a series of paper-mill and phosphate-mine pollution studies. A stop was made at the Welaka (Fla.), Station, to obtain bass material to be used in connection with the studies of mosquito control.

Late in July the field party moved west through South Dakota, Montana, and Idaho on the mine-pollution problems, and gave particular attention to the Black Hills gold-mine pollution of the Belle Fourche River, the copper-mine pollution of Clarks Fork, in the vicinity of Deer Lodge, Mont., and the lead and zinc pollution of the Coeur d'Alene River in Idaho.

From Idaho the party proceeded to Mt. Rainier and Mt. Shasta for a continuation of glacial-water pollution studies which have been in progress there for 3 years, and to make specific checks of silt conditions which will contribute to the fishery problems in the Sacramento River following the construction of a new dam, now in progress near Redding, Calif.

From California the party returned via Lake Mead, central Utah, Arizona, and New Mexico, stopping at established stations in these States where stream-pollution studies from mines and irrigation are in progress.

Studies of impounded waters were continued at Elephant Butte Reservoir, in cooperation with the United States Reclamation Service and the National Research Council, and at Lake Mead in cooperation with the same agencies and the National Park Service.

## HYDRAULIC SECTION

Harlan B. Holmes, *in charge*

For a number of years the Bureau of Fisheries has felt the need for a well-organized section in the Division of Scientific Inquiry in which the combination of biological and engineering talent could be applied to fish and fishery problems created by the construction of dams, reservoirs, and diversions for the purposes of power, irrigation, navigation, and flood control. The perpetuation of fish populations following the development of such projects requires a detailed analysis of the changes in biological and physical conditions, and of the biological requirements of the fish that inhabit the areas involved. As a general rule, the solution of those problems involves the construction of fishways to enable upstream migrants to pass over dams and other obstructions, and the installation of screens to prevent the entrance of downstream migrants into irrigation diversions and hydraulic turbines, in which they would be lost or injured.

For the study of these problems of fish protection, and the construction and operation of fishways, screens, and other protective works, there has been created within the Division of Scientific Inquiry a Hydraulic Section. Mr. Harlan B. Holmes has been appointed to the position of Aquatic Biologist, in charge, and Mr. Olaf W. Lindgren has been employed in the capacity of Associate Hydraulic Engineer. Funds for this section first became available in July 1938, but activities were not begun until late in the year when Mr. Lindgren entered the service. Mr. Holmes, who for a number of years has been loaned to the War Department, Corps of Engineers, in connection with fish problems at the Bonneville Dam, was not available to the Bureau of Fisheries until October 1939. Other members of the biological staff of the Seattle Laboratory have taken part in the work of fish protection.

The work of the Hydraulic Section during the year has included the partial construction of 4 large fish screens in Federal irrigation canals, the reconstruction of 2 existing screens, the operation of 6 screens throughout the irrigating season, aid in the study of fish problems in connection with the Shasta Dam Project, being constructed on the Sacramento River in California, and a preliminary study of fish problems in connection with many other Federal water projects. Consulting assistance in connection with fishway and screen problems also has been furnished to the conservation agencies of several States.

All of the screens operated by the Bureau of Fisheries were on Federal canals in the Yakima Valley; the Kittitas, Tieton, and Sunnyside canals on Bureau of Reclamation projects; and the Ahtanum, Old Indian, and Wapato canals operated by the Indian Service.

One of the screens reconstructed during the year is in the Pishkun Reservoir of the Sun River Project in Montana. It is a bar-type stationary screen. As originally designed, it provided insufficient screen area when the water level in the reservoir was low. The screen also had become damaged by ice. It was reconstructed and modified to correct the difficulties.

## ICHTHYOLOGICAL INVESTIGATIONS

*Fishes collected in the Panama Canal.*—Complete lists of the fishes collected in the locks of the Panama Canal in 1935 and 1937, together with discussions of the intermingling in the Canal of fresh- and brackish-water species from the opposite slopes of the Canal Zone, and the extensive invasion of fresh or nearly fresh water by marine fishes, are included in a recently published paper by Dr. Samuel F. Hildebrand, entitled "The Panama Canal as a passageway for fishes, with lists and remarks on the fishes and invertebrates observed." As indicated in the title, some invertebrates also are mentioned. Although many marine fishes enter and some pass through the locks, only one species, the tarpon, is known definitely to have completed the transit; in this case, from the Atlantic to the Pacific. Brackish- and fresh-water species from the opposite slopes intermingle freely.

*Fishes of Tortugas, Fla.*—A large monograph of the fishes of Tortugas, Fla., left unfinished by the late Prof. William H. Longley, was completed by Dr. Hildebrand. A total of 435 species are listed, 29 of which were discovered during the investigation. Much information of taxonomic importance was gained, and the knowledge of the life histories of many species was greatly extended, especially of the shallow-water forms which could be observed in their natural environment by the use of a diving hood.

*American anchovies.*—Taxonomic revisional studies of the American anchovies were continued by Dr. Hildebrand. Many interesting relationships, unrecognized species, and many misidentified specimens in various museum collections have been found. The numerous misidentified specimens in collections serve to show how imperfectly the species hitherto have been known.

*Systematic studies.*—Isaac Ginsburg continued his systematic studies of American fishes. Accounts were prepared of the genera *Enyphias*, *Barbulifer*, *Coryphopterus*, and *Parrella*. Material was gathered on the systematics of a number of other gobiid genera, with the object of preparing needed revisions. Population studies were made of some of the common species of *Microgobius*, *Lepidogobius*, and *Bathygobius*.

Population studies strike at the very root of one of the fundamental problems, not only of fishes, but of all biology, and that is the species problem. Offhand, this would hardly seem to be a problem. The layman, especially if he is of the observant type, seems to be able to distinguish well enough the comparatively few species of animals and plants with which he is familiar. The specialist, however, if he is a careful worker, sooner or later is confronted with the following questions: What is a species? What is a subspecies? What is a race? This is a real and fundamental problem in biology, about which a considerable degree of misapprehension exists, even among systematists. In connection with the population studies an attempt was made to reach down below the surface of the problem, and to evolve general principles and a method that will contribute to its solution. A paper was published supplementing others that have previously been published, dealing with this problem. Another paper, treating of another phase of the question, has been prepared and is now in press. The problem also has an important practical bearing. In our work of conservation it is important to distinguish properly, and understand, the interrelationship of the populations that make up the economically important fishes.

## INDEPENDENT ACTIVITIES OF THE BIOLOGICAL LABORATORIES

### WOODS HOLE, MASS.

During the summer, the U. S. Fisheries Laboratory at Woods Hole served as headquarters to Dr. Paul S. Galtsoff, In Charge of Shellfish Investigations, and the acting director and his staff. The laboratory facilities of the station were also used by John R. Webster, of the Bureau's North Atlantic staff, for studying the effects of various types of tags on mackerel.

As in previous years, the privilege of occupying facilities in the laboratory at the Woods Hole Station was extended to a small number of private investigators. Following is a list of such persons and the problems of their research during their stay at Woods Hole: Dr. Hugh M. Smith, former U. S. Commissioner of Fisheries, taxonomic studies of local fishes; Dr. Joseph M. Odiorne, Colby College, behavior of melanophores of *Fundulus;* Dr. Rastum Maluf, Johns Hopkins University, osmoregulative mechanisms in crayfish; Dr. Raymond W. Root, College of the City of New York, effect of carbon dioxide on the respiratory function of marine fish blood; Dr. Henry Brown, College of the City of New York, assistant to Dr. Root; Dr. Bolton Davidheiser, Johns Hopkins University, the effects of X-ray on males of *Sciara*.

### BEAUFORT, N. C.

Research facilities were provided throughout the year at the Beaufort Laboratory for biological studies of marine organisms and certain species of fish and shellfish of importance to the commercial fisheries of this region. During the summer season 28 investigators from other institutions conducted studies here in various fields of zoology. The chief investigations carried on by the Bureau's staff, under the direction of Dr. H. F. Prytherch, consisted of experiments in controlling the growth and reproduction of oysters; the utilization of improved marsh ponds and canals for intensive cultivation of clams and oysters, the propagation of diamond-back terrapin; and the rearing and live storage of certain marine fishes held in captivity in tidal bays. The fishery research program of the laboratory has been drastically reduced during the past year because of the lack of personnel and the necessity of supervising extensive improvements to the laboratory with funds provided by the P. W. A. and the W. P. A.

*Cooperative enterprises.*—Assistance and advice was given to the following agencies on matters pertaining to the marine fisheries and related industries of this general region: U. S. War Department, Corps of Engineers, concerning the construction of a larger inlet at the mouth of the New River, and its possible effect on the local oyster fishery; cooperation with the conservation departments of North Carolina, South Carolina, Virginia, and Maryland, on matters pertaining to the propagation and regulation of oysters, crabs, and terrapin, and certain commercial fishes; a joint program with Duke University for studies of ecology of marine organisms, and particularly the parasites of marine fish and crustacea was continued; for the Union Carbon and Carbide Corporation, corrosion tests with stainless steel cable in sea water were made; for the Aluminum Company of America and the United States Navy, antifouling and corrosion tests were made of various paints used on aluminum ship plate; and improvement of the laws for encouragement of oyster farming and the protection of the natural oyster resources of this State were suggested to the Shell-fish Committee of the North Carolina State Legislature. The terrapin-propagation operations of the laboratory were made available to representatives of the Universal News Service and Fox Movietone, Inc., who prepared motion-picture films of this activity for public display. Supervision of the operation of the North Carolina Fisheries, Inc., was continued and arrangements carried out for handling fish during periods of overproduction, with the assistance of the Federal Surplus Commodities Corporaton, and for the creation of a better market for clams through local processing, for a large canning concern.

*Independent investigations.*—The 28 independent investigators from other institutions, who were provided with laboratory facilities at various times of the year, were engaged in the following studies: Dr. W. C. George, University of North Carolina, lymphocytes of lamellibranchs; Dr. A. S. Pearse, Duke University, assisted by Helen J. Ramsey, environmental factors and faunas of sand beaches, parasites of marine animals; Dr. F. H. McCutcheon, North Carolina State College, respiration and blood of turtles; Dr. Bert Cunningham, Duke University, chemical studies of incubation of terrapin eggs; Dr. Walter E. Southwick, physiology of spermatozoa; Dr. Lawrence S. Ritchie, Womans College of the University of North Carolina, nuclear changes in protozoa; L. J. Flemister and Dr. Sarah E. Culbreth, Duke University, physiology of the swim bladder of fishes; Dr. William L. Engels and Dr. Richard A. Edwards, University of North Carolina, vertebrates of coastal islands; Dr. Wm. A. Kepner assisted by Wayland J. Hayes, Jr., University of Virginia, anatomy of Turbellaria; Dr. M. A. Stirewalt and Dr. F. F. Ferguson, University of Virginia, study of Rhabdocoeles; Dr. Katharine R. Jeffers, Duke University, effect of pituitary hormones on ovaries of marine fishes; Coit M. Coker, University of North Carolina, embryology of echinoderms; Dr. and Mrs. Paul A. Meglitsch, Wright Junior College, Myxosporidia and Sarcodina of fish; Dr. Sewell H. Hopkins, Texas A. & M. College, life cycle of parasites (especially Trematoda) of marine fishes; Dr. and Mrs. George W. Wharton, Jr., Duke University, the ecology of sand beaches; Wm. E. DeTurk, Duke University, parasites of crustacea; Dr. Gordon H. Tucker, University of North Carolina, egg development of an ascidian; J. Harry Allen, University of North Carolina, distribution of marine invertebrates; Sidney Shapiro, American Museum of Natural History, differential growth in scombriform fish; A. B. Hardcastle and Margaret Hardcastle, Duke University, life history and parasites of menhaden.

*Propagation of the diamond-back terrapin.*—The total production of young terrapin hatched and reared at Beaufort, N. C., amounted to 14,140 for the present season, and is the highest record obtained thus far in the culture of this species. The greatest previous annual production was obtained in 1938, when 13,600 were hatched in the 7 concrete breeding pens surrounding the station. This is the world's largest terrapin farm, or hatchery, and has supplied approximately 144,000 of these salt-marsh turtles for restocking coastal areas since the artificial propagation of this species was undertaken in 1909. The 1939 brood has been placed in special hibernating boxes in the large rearing house and will be distributed next spring throughout the South Atlantic region in cooperation with the various State conservation agencies.

The increased yield from these operations in the past 2 years can be attributed to experimental improvements made under the direction of Dr. Prytherch and Capt. Charles Hatsel, with respect to reducing the concentration of brood stock in certain of the breeding pens. For example, in one pen where the adult terrapin were provided with twice as much space in 1938 and 1939 as in 1937, the production of young increased from an average of 8 per female in 1937 to 10 and 11½ per female, respectively, in 1938 and 1939. Also, in the two new large pens, which provide ample room for the brood stock, the total production of young for each group of 500 adults—consisting of 400 females and 100 males—increased from 1,200 in 1937 to 3 360 in 1938, and 3,490 in 1939. In all of the experimental pens, in which crowding has been reduced, the average production of eggs per female terrapin showed increases ranging from 20 to nearly 200 percent in the past 2 years, with a fertility of over 95 percent. The increased production of young diamond-backs in 1939 is particularly significant and encouraging because seasonal conditions in that year were apparently less favorable for breeding than usual, as the 2 "control," or unimproved pens showed a decrease of over 20 percent in output in comparison with the average result obtained over a previous 5-year period. Also, during 1939, the brood terrapin were frequently disturbed, and their egg-laying activities were interfered with to a considerable extent while a P. W. A. project was in progress. This project made extensive improvements by elevating the concrete walls of all the pens, providing new tidal gates, and by enlarging the area of the egg beds.

The total brood stock at present consists of 570 males and 2,025 females, most of which have been in captivity for a period ranging from 10 to 25 years. In 1937 one of the pens was stocked with 320 wild terrapin, at a ratio of 70 males to 250 males, in order to determine the length of time required to reach satisfactory egg production. The output of young terrapin from this group increased from 460 in 1938 to 790 in 1939. Considerable interest in the terrapin-culture method developed at the Beaufort Station has been shown by the fisheries commissioners of Maryland and Virginia, who plan to inaugurate similar operations in their States within the next 2 years. In the spring, the output of the Beaufort Station usually is distributed in the coastal region from Maryland to Florida, after the young terrapin have been protected and fed for the first 9 months of their lives. This work has not only provided a large supply of young terrapin for restocking depleted salt-marsh areas, but has saved thousands from destruction by natural enemies such as rats, gulls, crabs, and other predators, by protecting them during the time of egg incubation and the hibernating period during the first winter, when they are in hiding along the shore just above high-water level.

*Experiments in marine fish farming.*—Over 15,000 salt-water fish, consisting chiefly of striped mullet, did not migrate as usual this winter, but instead were forcibly detained in experimental tidal ponds constructed at the biological laboratory at Beaufort, N. C. Two years ago these ponds were constructed in cooperation with the W. P. A. and the North Carolina Conservation Department in order to determine the possibility of utilizing salt-marsh ponds and small coastal bays for rearing and live storage of fish, and for oyster culture. The experimental operations, conducted here since 1938 under the supervision of Dr. Prytherch, have demonstrated that by improvement of tidal areas through the construction of dikes, sluice gates, or other devices, it is possible to grow mullet, spotted trout, flounders, channel bass, sheepshead, croakers, and several other common species in captivity, or store them in a live, healthy condition for many months until there is a favorable market. The ponds also proved satisfactory for protected natural spawning and rearing of the mullet, which is the most important food fish taken in the South Atlantic and Gulf States. The production of the striped mullet in this region amounts to approximately 40 million pounds annually, with a return to the fishermen of nearly 1½ million dollars. During periods when the markets are glutted with mullet the coastal ponds would make possible the temporary live storage of a considerable quantity, thus maintaining better prices for the fishermen and making available a supply of fresh fish at any season of the year.

In the fall of 1938 the experimental ponds were stocked with over 3,000 fish ranging in size from roe mullet, weighing over 5 pounds, to small immature fish having a length of 6 to 8 inches, which were approximately 1 year old. The fish were captured with nets during their fall migration and were transported to the pond by means of a perforated boat, or live car having a capacity of approximately 400 pounds. Most of the mullet were placed in the larger tidal pond, which has an area of approximately 2½ acres at low water, and a maximum depth of 15 feet, and receives an exchange of over 5 million gallons of water daily through the two tidal gates. Several hundred immature mullet were placed in the smaller observation pond, and in large concrete pools at the laboratory, where they have been studied with respect to feeding habits and ability to survive low water temperatures during the past 2 winters. The adult mullet spawned in captivity during November 1938, and stocked the pond with thousands of young which, by the latter part of December, had attained a length ranging from ½ to ¾ inch. Though no attempt was made to hold these young fish in the pond by the use of fine-meshed screen on the tidal gates, there was, nevertheless, a considerable number that remained in the ponds and grew to an average length of over 6 inches during the first year. Less than 1 percent of the fish died from injuries sustained during collection and transportation, or during the subsequent period of 15 months that they were held in captivity.

Operations during 1939 were conducted on a small commercial scale, using a special barge equipped with a built-in live box and water-circulating system, and capable of transporting 3,000 to 5,000 fish ranging in weight from ½ to 1 pound each. The catches of mullet were obtained from regular fishing crews who were able to transfer them directly into the barge without exposing the fish to air for more than a few seconds. On arrival at the storage pond the fish were released from the barge into a receiving lock, from which they swam into the pond with the flood tide. A total of over 12,000 mullet were placed in captivity by this procedure, along with a few hundred specimens of croakers, spot, pigfish, white perch, and other species.

No additional roe mullet were placed in the ponds in 1939, because it was important to first determine whether those held in captivity since the previous year had continued to grow and develop spawn to the extent that they would under natural conditions. A number of the largest fish were caught in October and November 1939 and examined as to quantity of spawn, condition of the flesh, and number of growth zones on the scales. These specimens, ranging in weight from 2½ to 5 pounds, were found to contain ripe roe which weighed from 6½ to 12 ounces, according to the size of the fish. Experienced local fishermen expressed the opinion that these mullet were in as fine condition, and as fully developed with roe, as those being captured at that time in the commercial fisheries. Studies of the scales showed that the growth of the impounded fish had been considerable since their last winter spawning period, and equivalent to that found in free individuals which had spent the previous summer in these waters. The general results indicate, therefore, that ponds of this type can be used not only for growing mullet without artificial feeding, but also as automatic marine hatcheries having an approximate output of 500 million fry per acre. The tidal flats and shallow areas in the ponds were also used successfully for oyster culture, which, at the same time, improved conditions for production of the natural food of the mullet.

*Improvements to the Beaufort Laboratory.*—Extensive repairs and improvements were made to the buildings, equipment, and grounds of the laboratory with funds provided by the P. W. A. and the W. P. A. The main laboratory and dormitory rooms were refinished inside with suitable wallboard, some new flooring was laid, and modern plumbing fixtures and improved electrical conduits and outlets for the experimental tanks and other special equipment were installed. The salt-water system was greatly improved by the installation of new pipe lines with continuous flow and valve arrangements that permit complete flushing and removal of sediment without interference with experiments. A new supply of fresh water is obtained from a 3-inch artesian well drilled on the island, which has an overflow of 25 gallons per minute that is distributed to the 8 terrapin pens. In the various laboratory rooms 10 new experimental tanks have been constructed and provided with flood lights and outlets for salt and fresh water, electricity, and compressed air.

The terrapin-rearing house was completely remodeled, and 12-foot additions were placed on each side; one for a small aquarium and the other for the storage of lumber, equipment, and supplies. In the aquarium a small exhibit of marine fish, turtles, crustaceans, and other aquatic animals has been made possible by the installation of 2 large circular tanks, 4 shallow rectangular tanks, and 12 glass aquaria. Five large outdoor tanks of reinforced concrete have been constructed for displaying large specimens. Considerable repairs were made to the sea wall, the terrapin pound, walks, driveways, and building foundations. A small pier and a 20,000-gallon storage tank for salt water were erected adjacent to the terrapin-rearing house in order to improve facilities for the feeding and care of the young terrapin.

With the assistance of the National Youth Administration it has been possible to improve considerably the exhibits of fish, crustacea, shellfish, etc., in the laboratory museum. An inexpensive method has been perfected for making accurate lifelike reproductions of marine fishes, from materials which appear satisfactory for permanent use in this climate. Casts of the following specimens have been added to the museum collection: A 75-pound ocean sunfish; 250-pound spotted whipray; 7-foot sailfish; 100-pound stingray; 6-foot sandshark; hammerhead shark; tarpon; amberjack; dolphin fish; sheepshead; angel shark; sturgeon, tripletail; Spanish mackerel; long-finned albacore; black drum; and many other common species of smaller size. This project is being continued in cooperation with a division of the W. P. W. that is preparing visual aids to education for use in schools, libraries, etc. Small exhibits are being developed showing interesting phases of fish life, commercial methods of capture, and the nutritional importance of marine fish and shellfish.

## APPROPRIATIONS

Numerous changes in the sources of funds for the Division of Scientific Inquiry brought about what appears to be a diminished amount available for fishery investigations during the fiscal year 1940. The appropriations for specific activities during the fiscal year 1939 included funds for travel and vessel operation made available from the deficiency appropriation of $76,000 during that year for the Bristol Bay salmon investigations. The appropriations for that work during the fiscal year 1940 were placed under the proper headings. The grand total of the appropriations for the fiscal year 1940 exceeded the 1939 grand total by $20,430. When proper adjustments are made for nonrecurring items in both fiscal years, an actual increase of $19,000 was realized in 1940.

The actual appropriation for the construction of fish screens and ladders in 1940 was equivalent to one-half of the 1939 sum, and an additional total of $4,380 was supplied from other sources in order to maintain the program. Provision was made in the 1940 appropriations for the construction of a small permanent laboratory at Little Port Walter, in Southeastern Alaska.

Additional funds were received for the fiscal year 1940 from the Works Progress Administration for the improvement of the biological station at Pensacola, Fla. The National Industrial Recovery allotment provided $25,000 for the completion of a new biological laboratory at Milford, Conn., and $125,000 for the reconditioning and alteration of a commercial trawler which will become the new fishery research vessel, *Albatross III*.

Approximately one-half of all available funds of the 1939 and 1940 appropriations were spent during the calendar year 1939. A statement of the appropriations, allotments, and special funds available for the use of the Division is given in the following table:

| Project | 1939 | 1940 |
|---|---|---|
| Regular appropriations: | | |
| Commercial fishery investigations | $222, 300 | $186, 115 |
| Oyster-cultural investigations | 50, 620 | 54, 000 |
| Aquicultural investigations | 46, 880 | 55, 950 |
| Conserving fish by screens and ladders | 20, 000 | 14, 380 |
| Water quality studies | 11, 100 | 10, 600 |
| Washington laboratory and administration | 7, 100 | 4, 655 |
| Construction of Southeastern Alaska laboratory | ---------- | 7, 500 |
| Administrative reserve for savings | ---------- | 6, 300 |
| Total | 358, 000 | 339, 500 |
| Allotment for traveling expenses | 31, 620 | 38, 200 |
| Allotment for maintenance and operation of vessels | 30, 450 | 62, 800 |
| Total | 62, 070 | 101, 000 |
| Grand total | 420, 070 | 440, 500 |
| Special funds: | | |
| State of Virginia oyster fund | 5, 000 | ---------- |
| State of Maine lobster fund | 2, 500 | ---------- |
| Public Works Administration projects | 281, 050 | ---------- |
| Works Progress Administration projects | 127, 645 | 19, 000 |
| National Industrial Recovery projects | ---------- | 150, 000 |
| Total | 416, 195 | 169, 000 |

UNITED STATES DEPARTMENT OF THE INTERIOR
HAROLD L. ICKES, Secretary

BUREAU OF FISHERIES
CHARLES E. JACKSON, Acting Commissioner

Administrative Report No. 40

# ALASKA FISHERY AND FUR-SEAL INDUSTRIES IN 1939

By WARD T. BOWER

APPENDIX II TO REPORT OF COMMISSIONER OF FISHERIES
FOR THE FISCAL YEAR 1939

UNITED STATES
GOVERNMENT PRINTING OFFICE
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## ADMINISTRATIVE REPORT SERIES

Since the beginning of the Administrative Report Series, considerable confusion has arisen concerning the system of numbering the separates composing it. Inasmuch as the Reports of the Divisions vary in order from year to year, many have found their designations as "Appendix No. I, II, III, or IV" very confusing. To relieve this, it has been decided to number them as "Administrative Report No. —." Inasmuch as 20 separates had already been printed in this series before starting the numbers, it was deemed advisable to begin the numbering with Administrative Report No. 21. Of course, numbers cannot be printed on those already off the press, but for the information of those who wish to know what the first 25 were, they are numbered for filing purposes as follows:

No. 1. Report, Commissioner of Fisheries, 1931.
No. 2. Alaska Fishery and Fur-Seal Industries, 1930.
No. 3. Fishery Industries of the United States, 1930.
No. 4. Progress in Biological Inquiries, 1930.
No. 5. Propagation and Distribution of Food Fishes, 1931.
No. 6. Report, Commissioner of Fisheries, 1932.
No. 7. Alaska Fishery and Fur-Seal Industries, 1931.
No. 8. Fishery Industries of the United States, 1931.
No. 9. Progress in Biological Inquiries, 1931.
No. 10. Propagation and Distribution of Food Fishes, 1932.
No. 11. Alaska Fishery and Fur-Seal Industries, 1932.
No. 12. Progress in Biological Inquiries, 1932.
No. 13. Fishery Industries of the United States, 1932.
No. 14. Propagation and Distribution of Food Fishes, 1933.
No. 15. Fishery Industries of the United States, 1933.
No. 16. Alaska Fishery and Fur-Seal Industries, 1933.
No. 17. Progress in Biological Inquiries, 1933.
No. 18. Propagation and Distribution of Food Fishes, 1934.
No. 19. Alaska Fishery and Fur-Seal Industries, 1934.
No. 20. Fishery Industries of the United States, 1934.
No. 21. Progress in Biological Inquiries, 1934.
No. 22. Propagation and Distribution of Food Fishes, 1935.
No. 23. Alaska Fishery and Fur-Seal Industries, 1935.
No. 24. Fishery Industries of the United States, 1935.
No. 25. Propagation and Distribution of Food Fishes, 1936.

Note that the last Commissioner's Report was for 1932. Since then its place has been taken by a reprint from the report of the Secretary of Commerce under the title "Bureau of Fisheries." Inasmuch as it is no longer a Bureau publication, it is not numbered; but it will be supplied to any who request the Report of the Commissioner for any year since 1932.

# ALASKA FISHERY AND FUR-SEAL INDUSTRIES IN 1939[1]

By Ward T. Bower, *Chief, Division of Alaska Fisheries*

## CONTENTS

Page
- Introduction 97
  - Congressional investigation of the fisheries of Alaska 98
  - Visit of Acting Commissioner of Fisheries and other officials to Alaska 99
  - Fisheries Experimental Laboratory 100
  - Protection of walruses and sea lions 100
  - Japanese vessels in Bering Sea 101
- Fishery Industries 101
  - New fishery regulations 102
  - Annette Island Fishery Reserve 104
  - Stream improvement 104
  - Control of predatory trout 104
  - Stream marking 105
  - Stream guards 105
  - Vessel patrol 105
  - Aerial patrol 107
  - Complaints and prosecutions 107
  - Territorial legislation 111
  - Territorial license tax 111
  - Kuskokwim River 112
  - Yukon River 112
  - Weirs for counting salmon escapement 113
    - Alitak Bay 113
    - Chignik River 114
    - Chinik Creek 114
    - English Bay 114
    - Fish Creek 114
    - Kalgin Island Creek 115
    - Karluk River 115
    - Little Port Walter 116
    - Orzenoi River 116
    - Red River 116
    - Situk River 116
  - Salmon tagging 117
  - Salmon life-history studies 117
  - Observations on the escapement of salmon 118
  - General statistics of the fisheries 121
  - Salmon 124
    - Catch and apparatus 124
    - Canning 132
      - Changes in canneries 132
      - New canneries 133
      - Canneries not operated 133
      - Total canneries operated 134
      - Losses and disasters 136
      - Statistics 137
      - Pack in certain districts 141
      - Employment and wages 142
    - Mild curing 146
    - Pickling 147
    - Fresh salmon 148
    - Freezing 148
    - Dry-salted, dried, and other miscellaneous salmon products 149

Page

Fishery Industries—Continued.

Salmon—Continued.

- Byproducts 150
- Herring 150
  - Statistical summary 152
- Halibut 153
  - Statistical summary 153
- Cod 154
- Whales 155
- Clams 155
- Shrimp 157
- Crabs 157
- Oysters 158
- Miscellaneous fishery products 159
- Fur-Seal Industry 159
  - Pribilof Islands 159
    - General administrative work 159
    - Transportation of supplies 160
    - Power vessel *Penguin* 160
    - Roads 161
    - Buildings 161
    - Byproducts plant 162
    - Natives 162
      - Census 162
      - Medical service 163
      - Schools 164
      - Savings accounts 164
      - Payments for taking fur-seal skins 164
      - Payments for taking fox skins 165
    - Fur seals 165
      - Killings 165
      - Age classes 167
      - Computation of fur-seal herd 167
    - Foxes 168
      - Trapping season of 1939–40 169
    - Reindeer 169
  - Fur-seal skins 170
    - Shipments 170
    - Sales 170
    - Disposition of fur-seal skins taken on Pribilof Islands 174
  - Shipment and sale of fox skins 175
  - Fur-seal patrol 175
    - United States Coast Guard 175
    - Bureau of Fisheries 176
  - Sealing privileges accorded aborigines 176
  - Japanese sealskins delivered to the United States 177
  - Substation for sea-otter patrol 177
- Computation of Fur Seals, Pribilof Islands, 1939 177
  - Bulls 178
  - Average harem 180
  - Pups and cows 181
  - Mortality of seals at sea 182
  - Complete computation 182

---

[1] Administrative Report No. 40, Appendix II to the Report of the U. S. Commissioner of Fisheries for 1940. Approved for publication July 18, 1940.

# INTRODUCTION

The preservation of the fishery resources of Alaska on a sound economic basis, while encouraging maximum utilization consistent therewith, and the protection and management of the fur seals that breed on the Pribilof Islands constitute the major activities of the Bureau of Fisheries in Alaska. Acting Commissioner Charles E. Jackson spent several weeks in the Territory in the summer of 1939 and initiated the policy of holding annual hearings in various fishing centers at the close of the season in order that persons engaged in the industry might have full opportunity to express their views. An investigation of the fisheries of Alaska was made also by a subcommittee of the Committee on Merchant Marine and Fisheries, assisted by a delegation from the Territorial legislature.

Regulations for the protection of the fisheries were modified in some respects during the progress of the season to suit unforeseen conditions. Evidence presented at the hearings and in briefs filed subsequently, as well as data gathered by Bureau employees engaged in fishery patrol and investigative work, was used as a basis for the revision of fishery regulations to be effective in the following season.

Law-enforcement duties and stream-survey work for the purpose of appraising the escapement of spawning salmon were carried on by a force of approximately 100 temporary employees in addition to the regular personnel. Fourteen vessels of the Bureau, 1 chartered vessel, 5 speed boats, and a number of small power boats were engaged in this work, and chartered airplane service was used for limited periods in some localities. Weirs were again operated in 12 typical salmon streams for counting the escapement of brood fish. Scientific studies with respect to the salmon and herring were continued.

Detailed statistics of the fisheries are published herewith. These include for the first time data with regard to the number of residents and nonresidents employed in the Alaska salmon canning industry, and the wages paid by that industry within and outside the Territory.

At the Pribilof Islands 60,473 fur-seal skins were taken; 2,109 more than in the preceding year. Killings in general were of surplus 3-year-old male seals, and provision was made for a suitable reserve of this age group. It was computed that the fur-seal herd as of August 10, 1939, contained 2,020,774 animals. Attention was given during the winter to the management of blue foxes on the Islands, and 1,258 fox pelts were obtained in the 1939–40 season.

The byproducts plant on St. Paul Island was again operated for rendering oil and meal from the fur-seal carcasses and blubber, and the output amounted to approximately 28,000 gallons of blubber oil, 4,800 gallons of oil from carcasses, and 251 tons of meal. Limited quantities were retained at the islands, chiefly for use in fox feed, and the remainder of these products were shipped to Seattle. A substantial portion of the meal and the entire shipment of oil were sold for commercial use.

The maintenance and upkeep of the villages, as well as the buildings and equipment devoted to the sealing industry, received attention, and some additional construction was undertaken, including work started on four new houses for natives on St. Paul Island. Some repairing and resurfacing of roads was done on both islands.

As heretofore, valuable cooperative service was rendered by the Coast Guard in maintaining a patrol for the protection of the fur seals and sea otters of Alaska, and by the Navy Department in detailing a vessel for transporting the annual shipment of supplies from Seattle to the Pribilof Islands and bringing out the season's take of fur-seal skins.

Acknowledgment is made of the assistance by members of the Bureau's staff in the preparation of this document.

## CONGRESSIONAL INVESTIGATION OF THE FISHERIES OF ALASKA

On July 17, 1939, the House of Representatives adopted Resolution 162 authorizing and directing the Committee on Merchant Marine and Fisheries, or a subcommittee thereof, to make an investigation of the fisheries of Alaska, particularly with reference to the use of traps in the catching of salmon, the advisability of maintaining or changing the prescribed fishing seasons, the effect of herring fishing operations upon the salmon fishery, offshore fishing by foreign nationals for crabs and salmon, and other matters concerning the conservation of the fisheries of Alaska and a reasonable development of the fishing industry.

Pursuant to this resolution a subcommittee was appointed, consisting of the following Members of Congress: Schuyler Otis Bland, Virginia, Chairman; Monrad C. Wallgren, Washington; Ambrose J. Kennedy, Maryland; Frank W. Boykin, Alabama; Richard J. Welch, California; George N. Seger, New Jersey; and James C. Oliver, Maine. This committee, accompanied by James W. Gulick, clerk, and Ralph J. Sterling, reporter, sailed from Seattle on August 20 on the Coast Guard cutter *Ingham* to conduct the investigation as directed.

In Alaska the Congressional committee was joined by a joint Territorial committee, appointed pursuant to House Concurrent Resolution No. 1 at the 1939 session of the Territorial Legislature to facilitate and assist in the Congressional investigation petitioned by that resolution. Five members of the Territorial Legislature had been appointed to the Territorial committee, as follows: Joseph Hofman, of Seward, and Henry Roden, of Juneau, members of the senate; and Harvey J. Smith, of Anchorage, A. P. Walker, of Craig, and James V. Davis, of Juneau, of the house of representatives. The committee which carried out the purpose of the resolution, however, was composed only of the four last-named members, as Senator Hofman died soon after the legislature adjourned and the vacancy was not filled.

Owing to the outbreak of war in Europe and the probability of an early call of a special session of Congress, the committee's work in Alaska was greatly accelerated, but hearings were held at all places scheduled, as follows: Anchorage, September 1 and 2; Kodiak, September 4; Cordova, September 5 and 6; Sitka, September 7; Juneau and Petersburg, September 9; Wrangell and Craig, September 10; and Ketchikan, September 11. Upon completion of the work in Alaska the committee left Ketchikan on the *Ingham* and arrived at Seattle on September 13. A further hearing on the Alaska fisheries was held by the committee at Seattle on September 14.

At every meeting supplemental statements and briefs were invited, and these, together with much additional information of a factual nature, were made a part of the record of the hearings.

A report of the investigation and recommendations of the committee with respect to various problems concerning the development and preservation of the Alaska fisheries was published as Report No. 2379 under date of June 5, 1940.

## VISIT OF ACTING COMMISSIONER OF FISHERIES AND OTHER OFFICIALS TO ALASKA

Acting Commissioner of Fisheries Charles E. Jackson, accompanied by Doyle C. Tripp as clerical assistant and reporter, left Washington on August 9 and sailed from Seattle on August 16 by commercial steamer for Alaska to investigate fishery matters and conduct a number of hearings with respect to the regulations. They disembarked at Ketchikan and continued the journey to Juneau aboard the *Brant*, returning later to Ketchikan to join the Congressional party on the Coast Guard cutter *Ingham* on August 22, for a cruise to points in southeast and central Alaska.

Public notice was given through the press that the Bureau would conduct hearings at specified places at the close of the salmon fishing season in connection with the fishery regulations for 1940 and, in addition to oral testimony presented there, would accept written evidence in the form of briefs at any time prior to December 1, 1939. These hearings, which were independent of those conducted by the Congressional committee, were held as follows: Anchorage, September 2; Kodiak, September 4; Cordova, September 5; Sitka, September 7; Petersburg, September 9; Wrangell, September 10; Ketchikan, September 11; and Juneau, September 16. After his return to Seattle on September 21, Mr. Jackson conducted hearings there also on September 25 and 26.

Seton H. Thompson, Assistant Chief of the Division of Alaska Fisheries, who was detailed to Alaska, with headquarters at Juneau, to exercise general field supervision of the Division's activities, participated in all the hearings conducted by the Bureau in the Territory. Mr. Thompson's detail from Washington began on May 28 and ended on October 14. He sailed from Seattle on the *Brant* on June 17 for Juneau and returned to Seattle by commercial steamer on September 29.

During the 1939 season a comprehensive investigation of the Bureau's work with respect to the fisheries, fur seals, and sea otters in Alaska, as well as a study of matters pertaining to the Bureau of Biological Survey, was made by Dr. Carl L. Hubbs, Curator of Fishes, University of Michigan, Ann Arbor, on behalf of Harold L. Ickes, Secretary of the Interior. Dr. Hubbs left Washington for the Pacific coast on June 17 and sailed from Seattle by commercial vessel on July 14. At Ketchikan he transferred to the *Brant* and proceeded to Juneau, where a schedule of his further itinerary was arranged. This included a trip on July 8 by airplane to Fairbanks, thence a journey to Anchorage via McKinley National Park, and on July 11 an airplane trip to Naknek. After several days in the Bristol Bay district, Dr. Hubbs was transported on the Alaska Game Commission's vessel *Brown Bear* to the Pribilof Islands and then to Unalaska, where he transferred again to the *Brant* to continue his journey, stopping at various fishing centers en route to Juneau. He returned to Seattle on the *Brown Bear* on September 20.

## FISHERIES EXPERIMENTAL LABORATORY

Steps were taken in 1939 toward the establishment of a fisheries experimental laboratory in Alaska to aid in developing production from the unutilized fishery resources and improved methods of curing and preserving species now utilized, particularly with a view to spreading employment in the fisheries over a longer period of the year.

This project was envisaged by the Territorial legislature in 1937, when it appropriated $20,000 for the purpose, the sum to be made available when the United States or some department or agency thereof should match or agree to match the amount in cash, equipment, or services. The Territorial act provided also for the establishment of a Fisheries Experimental Commission, consisting of the Governor of Alaska, the Alaska Agent of the Bureau of Fisheries, and a third member to be appointed by the Governor, to select a supervisor of the laboratory, obtain a suitable site and buildings, acquire necessary scientific instruments and equipment, and hire technical and clerical assistants.

Pursuant to this act, the sum of $50,000 having been allocated by the Public Works Administration for the construction of the laboratory in Alaska, the Commission members—Governor John W. Troy, J. W. Mendenhall of Ketchikan, and Seton H. Thompson, Assistant Chief of the Alaska Division of the Bureau of Fisheries and acting agent in charge of the division's work in Alaska during the season—met at Juneau on August 20 for the transaction of business. Governor Troy was elected chairman and Mr. Mendenhall secretary.

The Commission decided to enter into a cooperative agreement with the Bureau of Fisheries for the operation of the fisheries experimental laboratory and concurred in the recommendation of the Bureau that the laboratory be located at Ketchikan. It was decided also to establish the office of the Commission at the laboratory building when constructed, and Mr. Mendenhall was designated liaison officer with authority to contact appropriate officials of the Bureau regarding construction, maintenance, and operation of the laboratory. The laboratory will serve as headquarters for the Alaska technical and economic research staff, who will conduct studies on the capture, preservation, and marketing of Alaska fishery products.

Secretary Ickes approved the recommendation that the laboratory be erected on property under the control of the Treasury Department to the south of and adjoining the site of the Federal Building and Post Office in Ketchikan. Construction of the building will be started in the spring and it is anticipated that the work will be completed and the laboratory will be put in operation in the fall of 1940.

## PROTECTION OF WALRUSES AND SEA LIONS

A new (ninth) edition of Department of Commerce circular No. 286 was issued under date of June 29, 1939, containing the laws and regulations for the protection of walruses and sea lions in Alaska. The prohibition on the killing of walruses was extended to cover the period from July 1, 1939, to June 30, 1941, and the restrictions on the taking of sea lions were continued in effect. Walruses may be taken only by natives for food or clothing, by miners or explorers when in need of food, or by collectors of specimens for scientific purposes under permits issued by the Secretary. Similar conditions apply in respect to the taking of sea lions, and their killing is permissible also in the necessary protection of property or while the animals are destroying salmon or other food fish.

### JAPANESE VESSELS IN BERING SEA

The only reported fishing operations by Japanese vessels in Bering Sea waters in 1939 were those led by the crab-fishing depot ship S. S. *Toten Maru*, owned and operated by the Nippon Suisan Kabusiki Kaisya (Japan Aquatic Products Co.), accompanied by 3 self-navigating vessels and with 10 small craft carried on board, which arrived in Bering Sea on April 17 to engage exclusively in fishing for crabs. Its principal area of operation was in the open sea between latitude 55° and 57° N., and between longitude 163°30′ and 168° W. The Coast Guard on May 7 observed the *Toten Maru* anchored at latitude 56°22′ N., longitude 161°21′ W., with 5 sampans working gear near by and 2 approximately 80-foot Diesel craft setting gear to the southward. The vessels left Bering Sea by the middle of May and therefore did not interfere with the salmon fishery in that region.

In accordance with preliminary arrangements, the Japanese training ship *Hakuyo Maru*, of the Tokyo Fisheries Institute, made a training cruise in the Pacific Ocean and called at St. Paul Island on July 11 and 12 to give the students an opportunity to acquaint themselves with conditions concerning the breeding of fur seals and the facilities provided for their protection while breeding. On the morning of July 12 one party was furnished transportation to Webster Field at Northeast Point, and later in the morning a second party was taken to visit the Reef rookery from Observation Rock.

## FISHERY INDUSTRIES

As in corresponding reports for previous years, the Territory of Alaska is here considered in the three coastal geographic sections generally recognized, as follows: (1) Southeast Alaska—embracing all that narrow strip of mainland and the numerous adjacent islands from Portland Canal northwestward to and including Yakutat Bay; (2) central Alaska—the region on the Pacific from Yakutat Bay westward, including Prince William Sound, Cook Inlet, and the southern coast of Alaska Peninsula, to Unimak Pass; and (3) western Alaska—the north shore of the Alaska Peninsula, including the Aleutian Islands westward from Unimak Pass, Bristol Bay, and the Kuskokwim and Yukon Rivers. These divisions are solely for statistical purposes and do not coincide with areas established in departmental regulations.

Detailed reports and statistical tables dealing with the various fishery industries are presented herewith, and there are also given the important features of certain subjects of special investigation or inquiry.

## NEW FISHERY REGULATIONS

The regulations for the protection of the fisheries of Alaska, issued February 11, 1939, were amended by the following regulations issued under the dates indicated:[2]

[*June 2, 1939*]

### Alaska Peninsula Area

*Salmon fishery.*—Regulation No. 14, prohibiting commercial fishing for salmon by means of gill nets in certain waters west of 161 degrees west longitude, is hereby revoked.

### Aleutian Islands Area

*Herring fishery.*—Regulation No. 1 is amended to prohibit commerical fishing for herring, except for bait purposes, from January 1 to June 15, both dates inclusive, and from November 1 to December 31, both dates inclusive.

### Prince William Sound Area

*Herring fishery.*—Commercial fishing for herring, including bait fishing, is prohibited within one statute mile of Tatitlek village.

[*July 13, 1939*]

### Bristol Bay Area

*Salmon fishery.*—Regulation No. 18 is amended to increase by 24 hours the total weekly closed period for salmon fishing in all sections of the Kvichak-Naknek district, extending the midweekly closing to include the period from 12 o'clock midnight Tuesday to 12 o'clock midnight Thursday of each week.

[*July 21, 1939*]

### Bristol Bay Area

*Salmon fishery.*—Regulation No. 12 is hereby amended to prohibit commercial fishing for salmon in the Kvichak-Naknek district from 6 o'clock postmeridian July 22, to 6 o'clock antemeridian August 3.

[*August 2, 1939*]

### Southeastern Alaska Area

*Herring fishery.*—Regulation No. 4 is amended to read as follows: All commercial fishing for herring, except for bait purposes, is prohibited in the waters along the west coasts of Chichagof and Baranof Islands, including the coasts of adjacent small islands, from Cape Cross to Cape Ommaney and along the southeast coast of Baranof Island from Cape Ommaney to the light at Port Armstrong.

[*August 5, 1939*]

### Prince William Sound Area

*Salmon fishery.*—Regulation No. 10 is amended to read as follows: Commercial fishing for salmon is prohibited during the remainder of each calendar year after 6 o'clock postmeridian August 8: *Provided*, That this prohibition shall not apply (a) to trolling and gill netting through August 22 in the waters along the western coast from the outer point on the north shore of Granite Bay (known as Granite Bay Point) to the light on the south shore of the entrance to Port Nellie Juan, (b) to trolling in the period from 6 o'clock postmeridian August 8 to 6 o'clock postmeridian September 20 in the waters of Prince William Sound east of 147 degrees west longitude, exclusive of all waters of Valdez Arm north of Point Freemantle, and (c) to the operation of set or anchored gill nets in the period from

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[2] Pursuant to the Reorganization Act approved April 3, 1939, Reorganization Plan No. II dated May 9, 1939, and Public Resolution No. 20 approved June 7, 1939, the Bureau of Fisheries was transferred from the Department of Commerce to the Department of the Interior, effective July 1, 1939, and the duties with respect to the protection of the fisheries of Alaska devolved, accordingly, upon the Secretary of the Interior as of that date.

6 o'clock postmeridian August 8 to 6 o'clock postmeridian September 20 in the waters of Valdez Arm east of 146 degrees 25 minutes west longitude. All trap leads from shore to entrance of hearts must be removed prior to 6 o'clock antemeridian August 12.

[*August 22, 1939*]

### KODIAK AREA

*Salmon fishery.*—Regulation No. 12 is amended so as to permit commerical fishing for salmon by means of set or anchored gill nets from 6 o'clock antemeridian September 1 to 6 o'clock postmeridian September 30 in waters of Olga and Moser Bays which are not closed throughout the year to commercial salmon fishing.

### SOUTHEASTERN ALASKA AREA

#### SUMNER STRAIT DISTRICT

*Salmon fishery.*—Regulation No. 7 is amended so as to permit commercial fishing for salmon by means of gill nets and beach seines in Wrangell Narrows, exclusive of all waters within one statute mile of the mouth of Petersburg Creek, from 6 o'clock antemeridian September 1 to 6 o'clock postmeridian September 15.

[*August 22, 1939*]

### KODIAK AREA

*Herring fishery.*—Regulation No. 2 is amended so as to prohibit commercial fishing for herring, except for bait purposes, for the remainder of the calendar year after 6 o'clock postmeridian August 22: *Provided*, That this prohibition shall not apply to the use of gill nets.

[*September 25, 1939*]

### PRINCE WILLIAM SOUND AREA

*Herring fishery.*—Regulation No. 1 is amended so as to prohibit commercial fishing for herring, except for bait purposes, for the remainder of the calendar year after September 25: *Provided*, That this prohibition shall not apply to the use of set and drift gill nets of mesh not smaller than 2½ inches stretched measure between knots in the period from November 16 to December 15, both dates inclusive.

[*October 5, 1939*]

### SOUTHEASTERN ALASKA AREA

*Herring fishery.*—All commercial fishing for herring, except for bait purposes, is prohibited in the waters of Barlow Cove south of a true line westward from the outer extremity of Barlow Point.

[*October 10, 1939*]

### SOUTHEASTERN ALASKA AREA

#### SUMNER STRAIT DISTRICT

*Salmon fishery.*—Regulations Nos. 6, 7, and 8 are amended to permit commercial salmon fishing, except by traps, from 6 o'clock antemeridian October 1 to 6 o'clock postmeridian October 20.

#### CLARENCE STRAIT DISTRICT

*Salmon fishery.*—Regulations Nos. 6, 7, 8, and 10 are amended to permit commercial salmon fishing, except by traps, from 6 o'clock antemeridian October 1 to 6 o'clock postmeridian October 20.

#### SOUTH PRINCE OF WALES ISLAND DISTRICT

*Salmon fishery.*—Regulations Nos. 6 and 7 are amended to permit commercial salmon fishing, except by traps, from 6 o'clock antemeridian October 1 to 6 o'clock postmeridian October 20.

### SOUTHERN DISTRICT

*Salmon fishery.*—Regulations Nos. 6 and 7 are amended to permit commercial salmon fishing, except by traps, from 6 o'clock antemeridian October 1 to 6 o'clock postmeridian October 20.

Revised regulations effective in 1940 for the protection of the commerical fisheries of Alaska were issued by the Secretary of the Interior under date of January 4, 1940, copies of which may be obtained, without cost, upon application to the Fish and Wildlife Service, Washington, D. C.

## ANNETTE ISLAND FISHERY RESERVE

As in the previous year, the Annette Island Canning Co. operated the salmon cannery at Metlakatla under its lease from the Department of the Interior.

Eight salmon traps were operated by the company, the catch of which totaled 878,523 salmon of all species, and 11,845 salmon taken by seines and gill nets in the waters of the reservation were purchased from natives. In addition, 462,450 salmon were purchased from independent operators of seines, gill nets, and traps outside the reserve. All these fish were packed in the company's plant. In the operation of the cannery and fish traps employment was given to 51 whites and 319 natives.

The estimated profits to the Metlakatlan Indians of the reserve on the cannery operations for 1939 under the provisions of the lease amounted to $58,500.

## STREAM IMPROVEMENT

No extensive program was carried on in 1939 for the clearing of salmon streams to assure the accessibility of all spawning areas to brood fish. The only work of this kind, other than that performed by Bureau employees in connection with fishery patrol duties, was that conducted in the Cook Inlet area under an allotment of funds from the Territorial appropriation and contributions of the local salmon packers for clearing salmon streams. Two men were employed in that area for about a month, examining conditions of the spawning beds in tributaries of Knik Arm, and a third man was engaged for a short time in similar work on the Kenai River system. A number of beaver dams in these localities were opened to permit the passage of salmon to the spawning grounds.

The removal of log jams and other debris that prevented the ascent of salmon was reported for a few districts. Some work was done on the stream connecting the lower and upper lakes at Kaflia Bay, which stream is shallow and unusually rapid. A definite channel was constructed and crude resting pools were made at frequent intervals to facilitate the progress of spawning fish.

## CONTROL OF PREDATORY TROUT

In some parts of Alaska which are sparsely settled and infrequently visited by sport fishermen, Dolly Varden trout are exceedingly numerous and are regarded as unmistakable enemies of the commercially valuable fish, inasmuch as they feed voraciously on salmon eggs and fry. To curb their depredations, therefore, the Territorial Legislature for many years has appropriated funds, matched by contributions of local salmon packers, for the payment of bounty on Dolly Varden trout in certain red-salmon spawning streams, notably in the important Bristol Bay watershed. Some payments of this kind have been made also in the Cook Inlet area and at Yakutat.

Under these allotments a bounty of 2½ cents each is paid for predatory trout taken by bona fide residents of Alaska in the above-mentioned districts. The work is administered by the Bureau of Fisheries in connection with its patrol of the fishing grounds. During the period from October 1 to March 31, 4 special wardens of the Bureau, in addition to the watchman at the Naknek Marine Ways, attended to receiving and counting trout tails in the Bristol Bay area.

In 1939 the bounty for Dolly Varden trout in the Bristol Bay area amounted to $15,820.75, payments being made to 314 residents, of whom 96 were whites and 218 of one-fourth or more native blood. In the Yakutat district, 30,254 Dolly Varden trout were taken in 1939, for which the bounty was $756.35; and in the Cook Inlet area 32,547 trout were taken, the bounty amounting to $813.66.

Traps for catching Dolly Varden trout were placed in the four streams on Kodiak Island where salmon-counting weirs were operated. The catch of trout in these streams was as follows: 51,500 in Karluk River, 52,852 in Red River, and 22,769 in Olga Bay streams.

Studies of the Dolly Varden trout in the Kodiak area were continued.

### STREAM MARKING

New markers defining areas closed to commercial fishing were erected to replace those which had become defaced, and changes were made in the positions of others to conform to changes made in the regulations with respect to closed areas.

### STREAM GUARDS

The Bureau employed 105 men in 1939 as stream guards, weir operators, and special workmen in connection with law-enforcement duties. Of these, 49 were stationed in southeast Alaska, 33 in central, and 23 in western Alaska. Some of the workers were engaged for only a few days, but the average period of employment ranged from 2 to 5 months.

In southeast Alaska 22 stream watchmen provided their own launches and were assigned to patrol larger bodies of water or in the vicinity of several streams.

In central Alaska 6 guards were stationed in the Seward-Katalla district, 8 on Cook Inlet, 11 in the Kodiak-Afognak district, 3 at Chignik, and 5 in the Ikatan-Shumagin district. Two of the stream guards in the Seward-Katalla district provided their own launches.

In western Alaska 21 guards were on Bristol Bay and 2 on the Yukon River.

There were also 11 special employees engaged in scientific work—2 on herring and 9 on salmon investigations. In addition, there were 12 statutory employees and 50 men on the Bureau's vessels.

The foregoing makes a grand total of 178 persons identified with fishery protective work in Alaska in 1939, as compared with 209 in 1938.

### VESSEL PATROL

Fourteen vessels of the Bureau were engaged in the patrol for the protection of the Alaska fisheries in 1939. Of these, the *Auklet, Kittiwake, Merganser, Murre,* and *Widgeon* were operated in southeast

Alaska, the *Blue Wing* was on Prince William Sound, the *Eider* in the Kodiak area, the *Ibis* at Chignik, the *Red Wing* in the Alaska Peninsula area, the *Scoter* on Bristol Bay, and the *Coot* on the Yukon River.

The *Teal* patrolled the Cook Inlet area until August 24 and then proceeded to Prince William Sound to assist in the survey of salmon spawning grounds there. From September 30 to November 20 the vessel was detailed for cooperative work with the Alaska Game Commission in that district, under the direction of Wildlife Agent Clarence Rhode.

In the spring the *Crane* made a trip to southeast Alaska for the Division of Scientific Inquiry, carrying a cargo of cement and towing a scow load of construction materials for the Little Port Walter project. After delivering these supplies, the vessel was used in herring investigations along the west coast of Baranof Island, and later for a brief time in the vicinity of Craig. The entire trip from Seattle covered the period from March 4 to April 14. The *Crane* sailed again on May 18 to patrol the Alaska Peninsula area and returned to Seattle in September. The Bristol Bay field crew and supplies were carried on the trip north, in accordance with the usual practice.

The *Brant*, flagship of the patrol fleet, with Assistant Agent Fred R. Lucas aboard, sailed from Seattle for Juneau on January 4 to render service to the Territorial Legislature during its biennial session. From February 12 to 25 it assisted in the search for a passenger plane of the Marine Airways that was lost with 6 passengers while flying between Ketchikan and Juneau. In March a number of C. C. C. workers were transported from Juneau to Little Port Walter. The *Brant* returned to Seattle on March 30 and sailed again for Alaska on June 17. During the fishing season the vessel was used for the most part in supervisory work. From the middle of July to mid-August a trip was made from Juneau westward as far as Unalaska, with stops at intermediate points, primarily in connection with fishery investigations conducted by Dr. Carl L. Hubbs. Later the vessel participated in the survey of spawning streams and patrol of the fishing grounds in southeast Alaska, as well as furnishing transportation to Bureau and other officials as required.

Five speedboats were in operation: No. 1 on Bristol Bay, No. 4 in Prince William Sound, No. 3 on Olga Bay in the Kodiak area, and Nos. 5 and 6 in the Ketchikan and Juneau districts, respectively. Speedboat No. 6 was detailed to the Wrangell district during part of the season. Ten other small powerboats were in use also, of which 4 were on Bristol Bay, 2 at Chignik, and 1 each on Cook Inlet, on Prince William Sound, in the Yakutat district, and on the west coast of Prince of Wales Island.

In addition to the foregoing, the *Wingham* was again chartered to assist in the patrol of Copper River flats and Prince William Sound.

Besides its fishery patrol work, the *Scoter* participated in the fur-seal patrol at Neah Bay, Wash., in April, during the northward migration of the fur-seal herd.

The *Red Wing*, whose launching after the usual spring overhaul was delayed until June 18 because the ways upon which it rested had been damaged by earthquake, rendered short and unsatisfactory service during the season. Examination by local inspectors of the Bureau of Marine Inspection and Navigation showed that the vessel was in such poor condition that expenditure for additional repairs was unwarranted, and upon recommendation of that Bureau in August it was condemned and dismantled.

On May 21 the *Crane* struck a rock in Grenville Channel, which damaged the keel so that it was necessary to have the vessel hauled out for a few days on the marine ways at Ketchikan for repairs.

## AERIAL PATROL

The use of airplanes to supplement the vessel patrol of traps and fishing grounds for the protection of the Alaska fisheries, although limited by available resources and at times by unfavorable weather conditions, is of distinct advantage in the conservation work and should be greatly expanded. The speed with which distances may be covered along the indented coast line makes this type of patrol highly effective in deterring as well as in apprehending violators.

Chartered airplane service for the patrol of the fisheries in 1939 was furnished by 6 companies on 31 days. The total flying time was 64⅓ hours, during which the planes traveled 6,859 miles. This patrol included 2 trips made from Cordova in which evidence for convictions in 6 violations was obtained. One trip was made in the Cook Inlet area covering the east side of the Inlet from Anchorage to Kenai and the west side on the return to Anchorage. In southeast Alaska, from 6 to 11 hours flying time was used in each of the Juneau, Ketchikan, Wrangell, and west coast of Prince of Wales Island districts.

In addition, chartered airplane service was used for survey and photographic work in connection with scientific investigations of the salmon in the Bristol Bay region from May to October. Transportation was provided on 67 days during this period, the total flying time was 206 hours, and the distance covered was 20,645 miles. Considerable patrolling was done by aircraft in the Bristol Bay area, thus compensating, in part at least, for the lack of adequate patrol boats.

## COMPLAINTS AND PROSECUTIONS

In 1939, 57 cases of violation of the Alaska fishery laws and regulations were referred to representatives of the Department of Justice for prosecution. Six traps, 22 seine boats, 24 gill nets, and 5 trolling boats were involved in these violations.

Two cases were tried in the District courts, one at Juneau by jury, and one at Ketchikan by the court. In each of these cases the defendants were found guilty and were given substantial fines. All the other cases were tried in the U. S. Commissioner's court. Of these, the defendants in 42 cases pleaded guilty to the charges preferred against them and were fined. In addition, the salmon in their possession at the time they were apprehended were seized and sold for the account of the Government. In 6 cases the defendants were given suspended sentences, and in 2 cases they demanded trial by jury and were found not guilty. Five cases were dismissed.

In addition to the above, 4 gill nets and 1 purse seine that were being used in violation of the fishery laws and regulations were seized, the owners of which were not apprehended. The fish in the nets were released or sold and the gear was confiscated.

The following schedule lists the violations, by districts, and includes the penalties imposed.

*Details of complaints and prosecutions involving violations of Alaska fishery laws and regulations in 1939*

### KETCHIKAN DISTRICT

| Class of gear | Name of offender | Nature of offense | Disposition of case |
|---|---|---|---|
| Seine boat *Bogdan* | Mike Ukropina | Fishing during weekly closed period in Behm Narrows, Behm Canal. | Fined $50. Fish seized, value $35.67. |
| Seine boat *Mermaid* | James Leask, James Leask, Jr., Harry Leask, William Peratovich, and James Tatsuda. | Fishing within 500 yards of mouth of a salmon stream in Leask Cove, George Inlet. | Case dismissed. |
| Fish trap 39–442 | Owner: Estate of H. Pinkerton, represented by W. S. Balcom. Watchmen: Harry Bolt and Ben Arnold. | Fishing during weekly closed period. | Owner fined $200. Watchmen fined $50 each. |
| Seine boat *Tyee* | Angelo Bussanich, Nels Henderson, and B. Gomez. | Fishing during weekly closed period in Boca de Quadra. | Each man fined $50. Costs assessed $87.55. Fish seized, value $204.73. |
| Seine boat *Claire* | Solomon Guthrie, Ralph Bolton, Sr., and Mathias Simpson. | Fishing in closed waters of Very Inlet. | Fined $50. |
| Seine boat *Islander* | T. J. Brown and H. F. Godfrey. | do | Fined $50. Fish seized, value $130.60. |
| Seine boat *Sea Rose* | Richard Bratland, Charles Moore, Charles Granger, Al Cummings, and Arthur Orr. | Fishing in closed waters of Behm Canal at Roe Point. | Fined $125. Fish seized, value $345.51. |
| Trolling boat *Hercules.* | John Heikkila and George Wheeler. | Fishing during weekly closed period off Point Nelson. | 30-day suspended sentence. |
| Trolling boat *31–A–275.* | Pete Knutsen | Fishing during weekly closed period in Behm Canal. | Do. |
| Seine boat *Ann Page* | George Kegan, John Dexter, Arthur Hobbs, Frank Howard, Benson Johns, and Jim Barton. | Fishing during seasonal closed period in Kegan Cove, Moira Sound. | Each man fined $50. |
| Seine boat *Justna Deanna.* | George S. James, Robert Snook, John Anniskit, and Sheldon James. | Fishing in closed waters of Karta Bay. | Each man fined $100. |

### SOUTH PRINCE OF WALES ISLAND DISTRICT

| Class of gear | Name of offender | Nature of offense | Disposition of case |
|---|---|---|---|
| Fish trap 39–392 | Scow Bay Packing Co. | Fishing during seasonal closed period. | Owner fined $100. |
| Trolling boat *Thelma* | N. E. Nelson | Fishing during weekly closed period near McLeod Bay, Dall Island. | Case dismissed. |
| Trolling boat *Jeanetta.* | Y. Allain | do | Do. |
| Trolling boat *Lorena* | Paul Nelson and William Jones. | do | Nelson fined $50. Jones fined $25. |
| Seine boat *Sea Hag* | Ray Hammer, Warren Todd and, Harry J. McCallister. | Fishing with short gill nets in salmon stream near Klakas Lake. | Case dismissed; insufficient evidence. Illegal gear destroyed. |
| Seine boat *Bertha* | Frederick George, Robert Cogo, Robinson Beatty, and Seymour J. Samuelson. | Fishing in closed waters of Keete Inlet. | Defendants found not guilty by jury in U. S. Commissioner's court. |
| Seine boat *Alert* | Paul Cogo, Harry Natkong, and Thaddeus Morrison. | do | Do. |

### WRANGELL-PETERSBURG DISTRICT

| Class of gear | Name of offender | Nature of offense | Disposition of case |
|---|---|---|---|
| Seine boat *Christine II.* | Otto Feller | Carrying extra seine aboard fishing vessel at Thoms Place. | Fined $50. Fish seized, value $1.18. |
| Seine boat *Wesley* | S. N. Harvie | Fishing in closed waters of Bradfield Canal. | Fined $50. Costs assessed $9.50. |
| Gill net | Owner not apprehended. | Anchored gill net less than 50 fathoms in length fishing in closed waters of Red Bay. | Gear confiscated. Fish released. |

*Details of complaints and prosecutions involving violations of Alaska fishery laws and regulations in 1939*—Continued

WRANGELL-PETERSBURG DISTRICT—Continued

| Class of gear | Name of offender | Nature of offense | Disposition of case |
|---|---|---|---|
| Gill net | Owner not apprehended. | Barricading mouth of Big Creek, Red Bay. | Gear confiscated. Fish seized, value $13.75. |
| Purse seine | do. | Found in closed waters at head of Log Cabin Lake. | Gear confiscated. Fish released. |
| Gill nets | do | Found in Andrews Creek, a tributary of Stikine River. | Gear confiscated and detroyed. |
| Fish trap 39-417 | Owner: Alaska Pacific Salmon Co. Watchmen: George Lindberg and Walter Day. | Fishing during seasonal closed period. | Company fined $1,000. |
| Fish trap 39-247 | Owner: Alaska Pacific Salmon Co. Watchmen: Aubrey Schmidt and Olaf Gordon. | do | Do. |
| Gill net boat *Erna* | Thomas Rustad | Carrying three nets aboard fishing vessel, Red Bay. | Fined $50. |
| Seine boat *Loccolite* | Joe Petticrew, Everett Petticrew and Alan McKay. | Fishing in closed waters of Salmon Bay. | Trial in district court at Ketchikan, without jury. Fined $219.43. Costs assessed $135.80. Fish seized, value $430.57. Sixty-day jail sentence against each of the Petticrews, suspended. |
| Fish trap 39-393 | Scow Bay Packing Co. | Fishing during seasonal closed period. | Fined $100. |
| Set gill net | Martin Nore | Fishing within 500 yards of the mouth of Stikine River with illegal type of gear. | Fined $25 on each of two counts. |

JUNEAU DISTRICT

| | | | |
|---|---|---|---|
| Fish trap 39-402 | Owner: Alaska Pacific Salmon Co. Watchmen: A. J. Bebean and Antone Thomsen. | Fishing during weekly closed period. | Jury trial in district court. Company fined $750. A. J. Bebean fined $150. A. Thomsen found not guilty. |
| Seine boat *Skipjack* | Amel Teague, R. W. Brundage, Alex Hurman, and Albert Sharp. | Fishing in closed waters of Saginaw Bay. | Teague fined $50; each of others fined $25. Fish released. Ninety-day jail sentence against each man suspended. |
| Seine boat *31-B-185* | Fred Miller | Fishing for fox feed during seasonal closed period in Pybus Bay. | Fined $40. Costs assessed $5. |
| Seine boat *Agnes* | Frank Wooten | do | Fined $40. Costs assessed $9.50. |
| Seine boat *Starlite* | David Howard, Joe Johnson, Charles Jacob, and Ernest John. | Fishing at mouth of stream in Nakwasina Passage. | Captain Howard fined $50 and 3 crew members each $25; fines suspended. |

SEWARD-KATALLA DISTRICT

| | | | |
|---|---|---|---|
| Clam digging | Henry Mattson | Taking clams less than 4½ inches in length for commercial purpose. | Fined $25. |
| Gill net boat *31-B-536* | Joe Anderson | Fishing in closed waters at Cottonwood Point. | Fined $50. Fish seized, value $10.50. |
| Gill net boat *31-C-326* | Sigurd Ness | do | Fined $50. Fish seized, value $8.70. |
| Gill net boat *31-C-65* | Harris Makis | Fishing in closed waters near Russian River. | Fined $25. Fish seized, value $6.60. |
| Gill net boat *31-D-863* | Bill Skuflis and Mike Mitchel. | Fishing in closed waters between Cottonwood Point and Kokenhenik Island. | Each man fined $15. |
| Gill net boat *31-A-742* | Einer Nelson | do | Fined $25. |
| Gill net boat *31-B-819* | Jack Brady | do | Do. |
| Gill net boat *Emma* | Walter Hansen and A. L. Clift. | Fishing with anchored nets during weekly closed period in Bering River area. | Each man fined $25. Fish seized, value $39.80. |

*Details of complaints and prosecutions involving violations of Alaska fishery laws and regulations in 1939*—Continued

SEWARD-KATALLA DISTRICT—Continued

| Class of gear | Name of offender | Nature of offense | Disposition of case |
|---|---|---|---|
| Gill net boat *31-A-161* | J. R. Webber | Fishing with set nets during weekly closed period in closed waters of Bering River. | Fined $50. Fish seized, value $112.20. |
| Gill net boat *Eunice II* | Clarence Hahn | Fishing during weekly closed period in closed waters, Bering River. | Fined $100. Fish seized, value $71.10. |
| Gill net boat *Ya Sure* | Dick Fitzgibbons | Fishing in closed waters of Bering River Slough with set nets. | Fined $100. |
| Gill net boat *31-B-791* | Jim Mahturis | Fishing with set nets in closed waters of Russian Slough. | Fined $50. Fish seized, value $9.30. Gear confiscated. |
| Gill net boat *31-C-24* | A. Robbins | Fishing with set nets in closed waters of Dago Slough. | Fined $50. Fish seized, value $9.30. |
| Gill nets | Owner not apprehended. | Fishing with anchored nets near Grassbanks, Copper River delta. | Fish seized, value $53.10 Gear confiscated and destroyed. |
| Seine boat *Three Brothers.* | D. Patsos, Nick Poulas, and Nick Makarka. | Fishing in closed waters, Crab Bay. | Captain Patsos fined $50 and 2 crew members each $25. |
| Seine boat *31-B-678* | Jim Lafkiotis, Peter George and John Halostes. | Fishing in closed waters of Sheep Bay | Captain Lafkiotis fined $50 and 2 crew members each $25. |
| Seine boat *Wanda* | Owner: A. S. Day. Operators: John Bang, Clifford Stoner and Angus McDonald. | Fishing during seasonal closed period in Valdez Arm. | Owner fined $375. Fish seized, value $127.80. |

COOK INLET DISTRICT

| | | | |
|---|---|---|---|
| Gill net boat *Emard 70* | Elmer Hedberg | Fishing with set gill nets exceeding 35 fathoms in length and less than 600 feet apart between Susitna and Ivan Rivers. | Fined $50. |
| Gill net boat *Emard 75* | Chris Dinnsen | Fishing with set gill nets exceeding 35 fathoms in length between Susitna and Ivan Rivers. | Fined $50. Two king salmon seized and sold. |
| Gill net boat *G. F. C. 24.* | George Johnson | Fishing with set gill nets exceeding 35 fathoms in length and less than 600 feet apart near Ivan River. | Fined $100. One king and 18 red salmon, seized and sold. |
| Gill net boat *Emard 72.* | Andrew Ness | Fishing in Ivan River with set net exceeding 35 fathoms in length. | Fined $50. Twelve king salmon seized and sold. |

ALASKA PENINSULA DISTRICT

| | | | |
|---|---|---|---|
| Seine boat | John Verskin | Beach seine fishing in closed waters of Thin Point Lagoon. | Fine $500, suspended. Fish seized, value $80. |

BRISTOL BAY DISTRICT

| | | | |
|---|---|---|---|
| Gill net boat *A. P. A. 136.* | John Trumure and Steve Bacich. | Fishing during weekly closed period, Naknek. | Case dismissed. |
| Gill net boat *A. P. A. 25-A.* | John A. Knudsen and Nick Yakulik. | Fishing during weekly closed period in Kvichak Bay. | Fines $25 each, suspended. |
| Gill net boat *A. P. A. A-72.* | Eurea Andrew and Mike Wassili. | Fishing during weekly closed period in Kvichak Bay with gear not properly marked. | Do. |
| Gill net boat *A. S. Co. 6.* | Ole Hagen and P. I. Anderson. | Fishing within 100 yards of a stake net near Ekuk Bluff, Nushagak Bay. | Fined $25 each. |
| Gill net boat *C. R. P. A. A-39.* | C. Wamser and Wayne J. Niemi. | Setting net within 100 yards of another net near Naknek Point. | C. Wamser fined $25. Wayne J. Niemi acquitted. |

## TERRITORIAL LEGISLATION

At its biennial session in 1939 the Alaska Legislature passed an act increasing the bounty on hair seals, which are destructive to salmon and other fishes in certain localities. The amount of the bounty is now $3 instead of $2 as formerly. No change was made with regard to the regions in which such bounty is applicable.

The sum of $60,000 was appropriated for bounties on hair seals, including unpaid bounties earned during the previous biennium, and $25,000 was appropriated for the clearing of salmon streams as provided by law. An appropriation of $10,000 was made to defray expenses of a Joint Committee on Fisheries, to be chosen from the Territorial Legislature to assist a Congressional committee in an investigation of the Alaska fisheries.

The law of 1933 relative to the licensing of fishermen was amended to clarify the definition of the term "resident fisherman."

An act was passed to protect women workers in Alaska, prohibiting the employment of a female person under the age of 16 in any mercantile or industrial business, establishing minimum wage rates for those over the age of 18 and maximum hours for women in domestic employment, making it a misdemeanor to discriminate against an employee for testifying in any investigation relative to the enforcement of the act, and limiting the penalty for violation of any provision of the act.

## TERRITORIAL LICENSE TAX

Fisheries license taxes were collected by the Territory under the general revenue law of 1921, as amended in subsequent sessions of the Territorial Legislature. A statement from Oscar G. Olson, Territorial Treasurer, under date of May 14, 1940, gives the collections made to the close of April for the year 1939, representing the taxes on operations of the previous year. It was stated that collections under the several schedules were fairly complete, although several of the fishery companies had not yet made full settlement.

*Fishery license taxes collected by Territory for fiscal year ended Dec. 31, 1939*

| Schedule | Division No. 1 | Division No. 2 | Division No. 3 | Total |
|---|---|---|---|---|
| Salmon canneries (pack) | $83,269.04 | $15.20 | $346,562.96 | $429,847.20 |
| Clam canneries (pack) |  |  | 88.02 | 88.02 |
| Salteries | 1,477.50 | 60.74 | 1,112.81 | 2,651.05 |
| Cold-storage plants | 1,175.00 |  | 10.00 | 1,185.00 |
| Fish-oil works and fertilizer and fish-meal plants | 9,706.00 |  | 14,669.26 | 24,375.26 |
| Fish traps | 55,000.00 |  | 29,500.00 | 84,500.00 |
| Trap catches in excess of 100,000 fish | 3,585.15 |  | 12,224.27 | 15,809.42 |
| Gill nets | 507.20 | 10.00 | 4,632.00 | 5,149.20 |
| Seines | 3,950.00 |  | 2,111.00 | 6,061.00 |
| Clam diggers: |  |  |  |  |
| Resident | 2.00 |  | 243.00 | 245.00 |
| Nonresident |  |  | 30.00 | 30.00 |
| Fishermen: |  |  |  |  |
| Resident | 2,514.00 |  | 2,542.00 | 5,056.00 |
| Nonresident | 19,025.00 |  | 60,400.00 | 79,425.00 |
| Total | 180,210.89 | 85.94 | 474,125.32 | 654,422.15 |
| Salmon canneries (net income) not possible of segregation as to judicial division |  |  |  | 8,712.83 |
| Total collections |  |  |  | 663,134.98 |

## KUSKOKWIM RIVER

No patrol was maintained by the Bureau on the Kuskokwim River in 1939, and the only information available concerning the fisheries there is that obtained through correspondence by the Inspector in charge of the Yukon district. It was stated that the catch of king salmon was about the same as that for 1938 but there was a shortage of other species all along the river, and the catch thereof was only about a third of that for the preceding year. Only one operator, Robert Gierke, engaged in commercial fishing for the outside market; his production amounted to 2,000 pounds of pickled king salmon.

It was estimated that fishing operations for local food requirements were carried on by the same number of persons as in the preceding year, namely, 380 natives, and that they used 500 gill nets of 13,000 fathoms, 47 wheels, and several small boats. Their total production was estimated at 75 tons of dried chum salmon, 6 tons of dried reds, and 21 tons of dried kings.

## YUKON RIVER

As in the previous year, three outfits on the Yukon River prepared mild-cured salmon for the outside market, as follows: the Northern Commercial Co., which operated on a scow in Acheron Channel; St. Mary's Mission, at the head of Sunshine Bay in Aeropok Slough; and Chris Lauridsen, at Kwiguk Slough. Their total output of mild-cured salmon was 166 tierces[3] of kings. Only natives are employed in this district and the industry, although on a very small scale, means a great deal to them, as it gives them an opportunity to earn a little money with which to buy necessities which they would not otherwise have.

A patrol of the Yukon River was again maintained by Inspector Calvin F. Townsend, aboard the *Coot*. The vessel left Nenana on May 25 for the mouth of the Yukon and returned there on September 26. In all, it traversed 4,328 miles during the season.

On the trip downstream, from May 25 to June 8, the *Coot* afforded transportation to Acting Director Charles G. Burdick, of the C. C. C. in Alaska, who was making a survey of the people residing along the Yukon in order to plan the conservation work in that locality. From August 30 to September 6 Vera B. Harmon, Supervisor of Social Welfare of the Office of Indian Affairs, was a passenger, visiting the camps at which stops were made between Marshall and Anvik.

King salmon were late in entering the Yukon, as the ice was still solid at the mouth of the river on June 7 and did not go out until June 10. The first catch was made on June 16, or about 10 days later than in former years. The largest catch for the season was made on June 22, after which there was a gradual decline. Commercial fishing for export was discontinued on July 15. The kings this year were unusually large, averaging 55 to the tierce. During the early part of the run, a boat from Nome came into the Yukon and purchased 200 fresh kings for transfer to that place. A price of 50 cents each was paid for these fish.

Chum salmon began to enter the river at the same time as the kings, and the run reached its peak on July 9, declining gradually thereafter so that by July 29 no chums were being caught. Although the fish were of large size, they were lacking in oil, and when dried they shriveled to less than 1 pound each.

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[3] For the purposes of this Report the tierce has been computed on a basis of 800 pounds net.

The silver salmon began to run on August 10, but, except for a few days, they did not appear in large numbers while fishing was being carried on. This species often comes late in September, after most of the natives have quit fishing. The silvers this year were about the usual size and very fat.

In general, the catch along the Yukon during the season was light, except at a few places. The catch all along the Tanana was said to be even lighter than in the preceding year, when a marked shortage had been reported.

Products of the Yukon and Tanana fisheries, including those shipped to the outside market, were as follows: 152 cases of king salmon canned; 166 tierces of mild-cured and 3,200 pounds of dry-salted kings; and 126 tons of dried chums. Apparatus consisted of 204 wheels, 67 gill nets of 1,244 fathoms, 3 motor vessels of 43 tons, 1 launch, 3 power dories, 9 gill-net boats, and 30 rowboats.

## WEIRS FOR COUNTING SALMON ESCAPEMENT

Twelve weirs for counting the escapement of salmon en route to the spawning grounds were operated during the 1939 season in representative salmon streams of southeast and central Alaska for the purpose of determining the ratio of escape to commercial catch, with a view to reserving 50 percent of the runs for spawning, as required by law.

The Chignik weir was successfully operated again, after having been discontinued in the previous year when unusually high water prevented its installation at the beginning of the season. A weir structure was used for the first time in the Kalgin Island Creek, where counts of brood fish had previously been made without the aid of any structure, this being a relatively small stream. The Klawak weir, which had been in operation from 1930 to 1938, except in the 1933 season, was not installed this year.

### Alitak Bay

In the two major red-salmon streams of Olga Bay, tributary to Alitak Bay, weirs were again installed through which the brood fish were counted as they passed upstream. At the cannery station creek counting began on May 19 and continued through September 19, during which time the escapement was 59,486 red salmon, 20,002 pinks, 12,439 cohos, and 7 kings. At the upper station weir counting was carried on from June 7 to September 19, inclusive, and the escapement totaled 336,479 reds and 4,186 pinks. In addition, it was estimated that 3,000 red salmon ascended the stream at the upper station before the weir was in operation and 20,000 ascended after the structure was removed.

Traps operated at both weirs for taking Dolly Varden trout captured 22,769 of these predatory fish. Of this number, 8,893 were taken at the upper station and 13,876 at the cannery station.

Weir operations at the upper station were carried on by George Thompson until about the middle of August and then by Woodrow Buckley; while at the cannery station Lloyd T. Burns again was in charge. Warden J. Steele Culbertson supervised their work until his transfer to Juneau the middle of July, after which Special Agent Ralph A. Ferrandini directed operations in the area.

## Chignik River

Construction of the Chignik weir was begun on May 4 at a site about 75 feet above that used in 1937. The structure was completed on May 25 but the salmon did not begin to pass upstream until May 31, on which date 82 reds were tallied. A heavy run began on June 13 and the bulk of the season's escapement occurred during the next 3 or 4 weeks, reaching its peak on June 27, when 96,020 red salmon were counted. When counting was discontinued at the close of September 5, the total escapement numbered 1,615,207 red salmon, 2,235 kings, and 13,770 cohos. The commercial catch of red salmon from the Chignik run was 1,411,979.

The seaward migration of fingerlings during the season appeared to be very light. The first migrants were seen going down the river on May 6, but no appreciable numbers were observed until June 10. The best migration occurred from June 15 to July 8, after which it gradually diminished and ended on August 10. A local resident at Chignik Lake stated that after the earthquake of December 10, 1938, which was quite severe in that locality, he observed great numbers of dead fingerlings floating on the lake. This may be the reason for the light migration.

Warden Charles Petry was in charge of the weir operations at Chignik.

## Chinik Creek

The weir in Chinik Creek, a tributary of Kamishak Bay, Cook Inlet, was operated in 1939 by Gilbert M. Chambers under the direction of Capt. R. L. Cole. From July 3 to 28 there were counted 4,076 red salmon. It was estimated that 500 fish were in the creek below the weir at the time the structure was removed.

## English Bay

The weir in the red-salmon stream at the head of English Bay was completed and ready for operation on May 27. Counting began on May 28 and was continued through August 16, when the total escapement numbered 48,777 red salmon and 958 pinks. This is the largest count that has been made at this weir since its operation began in 1927 and is more than twice the previous record escapement of 24,025 in 1928. This increased escapement may be attributed, in part at least, to the fact that the fish trap which was previously operated to the south of the stream near Flat Island was not installed this year. Percy G. Maltbie was again in charge of operations, under the direction of Capt. R. L. Cole.

## Fish Creek

Fish Creek, flowing into Knik Arm, is the most important of the red-salmon streams of Cook Inlet in which the Bureau maintains a weir for the counting of brood salmon. The first red salmon passed through the Fish Creek weir on July 11. About a week later the run began in substantial numbers, and the bulk of the escapement came in the next 3 weeks. Counting was continued through August 12, at which time the total escapement consisted of 116,783 reds, 2,764 cohos, and 332 pinks. The peak of the red-salmon run was on July 22, when 14,961 fish were counted through the weir. George T. Press carried on the work at this place, under the supervision of Capt. R. L. Cole.

### KALGIN ISLAND CREEK

A weir was installed in Kalgin Island Creek for the first time, and from June 24 to August 11, inclusive, there were counted 27,424 red salmon and 8 pinks. It was estimated that an additional 2,500 red salmon passed upstream before the weir was put in. The escapement was the largest ever recorded at this stream. Although no weir had been operated previously, a fairly accurate count of the brood fish had been made nearly every year from 1927 to 1938 by the stream guard stationed there, without the use of a rack, as the stream is very narrow and shallow. Hans Peter Jensen operated the weir in 1939, under the direction of Capt. R. L. Cole.

### KARLUK RIVER

The Karluk weir was completed on May 19, although considerable difficulty was experienced with its installation because of high water. A large body of red salmon came into the lagoon below the weir the week following its completion, but only a small number passed upstream prior to June 4. The first run, which was far below average, was over shortly after the middle of July. The second run developed fairly well during the first 2 weeks in August but in the next 2 weeks showed a decided decline. Beginning on August 29 the run again picked up and the bulk of the escapement from the second run came in from that date until September 12. The weir records show an escapement of 666,004 red salmon, 6,232 kings, 31,944 pinks, and 12,308 cohos. In addition it was estimated that about 40,000 reds passed upstream after counting was discontinued and the weir was removed at the close of September 22. The commercial catch of red salmon from the Karluk run was 493,948.

As the commercial catch of red salmon exceeded the escapement by 38,000 on July 22, the Karluk area was closed to commercial fishing at that time and was not reopened until 6 o'clock antemeridian August 5.

Two traps for the capture of predatory Dolly Varden trout were again operated at the Karluk weir. During the early part of the season they were set to catch the downstream migrants, and later, when the Dolly Vardens started coming back into the stream from the sea, they were set to catch the upstream migrants. In all, 51,500 Dolly Varden trout were captured and destroyed. A small number of steelhead trout entered the traps along with the Dolly Vardens, but they were liberated without injury.

James O'Brien, who was again weir foreman, sustained a serious injury by a fall from the weir on August 21, and Tom Frost was in charge of operations thereafter. The work was under the supervision of the warden.

## LITTLE PORT WALTER

In view of the extensive research program contemplated at Little Port Walter by the Division of Scientific Inquiry, a new type of weir was designed and constructed there to be used in connection with the Division's investigations. Unlike the usual tripod type of weir, which is installed in the spring and dismantled at the close of the season, this new weir has a permanent base of reinforced concrete. Upon the concrete foundation panels of wooden pickets, much the same as those used on the usual type of weir, are erected for the period of weir operation. In addition to counting the escapement of brood fish, it is the purpose to count the migrants coming downstream in the spring, in order to obtain further information concerning the returns from escapements of known size.

Counting began on August 17 and continued through September 26. The run in general was rather irregular, but the bulk of the escapement came during the period from August 21 to September 11, reaching its peak on September 7, with a count of 4,514 pink salmon for that day. The total count for the season numbered 16,830 pinks, 122 cohos, 117 chums, and 7 reds.

## ORZENOI RIVER

From June 17 to August 3, inclusive, there were counted through the weir in Orzenoi River 10,414 red salmon, 858 pinks, 393 chums, and 44 kings. The peak of the run was on July 18, when 1,665 red salmon were tallied. At times during the first part of the season the water was black from the settling of ash from volcanic eruptions. Gordon Ashton was again in charge of the weir work, under the direction of Warden Mark A. Logan.

## RED RIVER

The weir structure at Red River was completed on May 28, the work having been handicapped somewhat by high water. Some salmon were seen passing upstream while the work was in progress, but the number was small. The total count of salmon through the weir from May 28 to August 24, inclusive, was 183,627 reds, 8,077 kings, 5,649 pinks, and 1,624 cohos.

Because of the light run, the Red River district was closed to all commercial fishing on July 22, and it was not reopened. Two trout traps operated in connection with the weir caught 52,852 Dolly Varden trout during the season.

Tom Frost was in charge of the weir, under the supervision of the warden.

## SITUK RIVER

The weir in Situk River was in operation from June 10 to August 1, inclusive, after which high water practically wrecked the structure and it became necessary to remove it from the stream. Commercial fishing was suspended on July 3 and 4 in order to provide for necessary additional escapement. Situk had a normal run of reds, of which about 50 percent escaped for spawning purposes. The total escapement numbered 167,620 red salmon, 2,117 kings, and 9,141 pinks. Alex W. Tveter was in charge of the weir, under the direction of Warden William B. Berry.

## SALMON TAGGING

In continuation of the tagging experiment conducted in southeast Alaska in 1938 with respect to the pink salmon run in lower Chatham Strait, 2,100 pink salmon were tagged in 2 Tebenkof Bay traps in 1939, the work being carried on during the weekly closed periods throughout the commercial fishing season by the Division of Scientific Inquiry. Of the total number tagged, 684 were recaptured, mostly within 5 days from the date of their release and at a distance of 40 miles or more from the place of tagging. One of the recaptured fish had traveled 162 miles. The returns indicated that the general trend of migration of the pink salmon entering lower Chatham Strait is northeast into the inside waters of Frederick Sound, Stephens Passage, and the Stikine River region.

Tagging experiments were carried on also on the south side of the Alaska Peninsula between the Shumagin Islands and Isanotski Strait to develop further information concerning the migration routes of salmon in those areas.

Analyses of the data with regard to the above tagging experiments are contained in Administrative Report No. 39, entitled "Progress in Biological Inquiries, 1939."

## SALMON LIFE-HISTORY STUDIES

Studies of the life histories and fluctuations in abundance of the Pacific salmon in Alaska were continued in 1939 by the staff of the Fisheries Biological Laboratory at Seattle, Wash. The major investigations of the red salmon in Bristol Bay and at Karluk, on Kodiak Island, and the pink salmon at Little Port Walter, in southeast Alaska, were carried on as formerly.

The cutter *Redwing* was detailed by the U. S. Coast Guard to carry on the hydrographic studies in Bristol Bay. These studies are yielding valuable information on the soundings, currents, temperatures, and chemical properties of the waters in the Bristol Bay region of Bering Sea. Two large seine-type boats were chartered for experimental salmon fishing in these waters to determine the migration routes, abundance, and availability of the salmon in the offshore waters.

An aerial survey was made of the large river systems in Bristol Bay in which the salmon reproduce. This survey was made for the purpose of estimating the potential spawning areas in the streams and lakes available to the salmon and the extent to which they were seeded.

The study of the factors responsible for the fluctuations in the abundance of the Karluk River red salmon was continued with special reference to the influence of predatory Dolly Varden trout on the survival of the young salmon during their sojourn in the tributary streams and lakes.

The study of the factors responsible for the fluctuations in the abundance of the pink salmon of southeastern Alaska was continued at Little Port Walter. During the past year a permanent counting weir and small laboratory were constructed at Little Port Walter through the cooperation of the United States Forest Service, which furnished C. C. C. labor for the construction.

## OBSERVATIONS ON THE ESCAPEMENT OF SALMON

The runs of salmon in each district of Alaska are observed closely by field employees during the commercial fishing season, and regulations are modified wherever necessary to permit the fullest possible utilization of this resource consistent with conservation requirements. Following the close of commercial operations a survey is made of the spawning areas in representative streams in each section of the Territory. These surveys provide an accurate measure of the adequacy of existing regulations and also serve as an index for determining the probable extent of runs in future cycle years.

*Southeastern Alaska.*—In the Ketchikan section, embracing the southern district and that part of the Clarence Strait district south of Ernest Sound, pink and chum salmon runs were the weakest in recent years, while reds appeared in about average volume. The run was the latest that has occurred in the past 4 years. Some streams that contained practically no fish by the middle of September were comparatively well stocked by the latter part of that month. Ketchikan Creek was the only stream in which salmon were observed in considerable numbers before the latter part of September.

In the southern district good escapements were found in Robinson Creek, Chickamin River, and in some streams in Mink Bay, Boca de Quadra and Smeaton Bay, while other streams on the east side of Behm Canal had only fair or poor escapements. In the west arm of Behm Canal good escapements were observed in streams of Yes Bay, Moser Bay, and at Loring, although a number of other streams in this section were inadequately seeded. Along the east coast of Prince of Wales Island certain streams were especially well seeded, and good escapements were found also in the Crab Bay stream on Annette Island and in the Vallenar Bay stream on Gravina Island. In general it may be said that the runs of pinks and chums in the Ketchikan section were small and that the escapement of these two species was spotted, while the run and escapement of red salmon were about average.

In the Wrangell district, including Sumner Strait and the northern section of Clarence Strait, the escapement was satisfactory for the most part, although unevenly distributed. Pink salmon streams in the northern section of Clarence Strait were unusually well stocked, while the escapement along the eastern shore of Kuiu Island and on the southern shore of Kupreanof Island was below normal. Chum and coho spawning areas were poorly seeded, and the escapement of reds was about normal.

The run of pink salmon on the west coast of Prince of Wales Island was very late and was at no time heavy or sustained. An increase in abundance occurred after August 19, but the peak of the run was reached by August 26, before the season closed. A late showing of pinks in the southern part of the district provided a fair escapement in this section. Streams in the northern part of the district were poorly seeded, with the exception of those in Calder Bay and Davidson Inlet. Staney Creek in Tuxekan Passage had a very poor escapement. In general, the escapement of pinks, chums, and cohos was inadequate, while the seeding of red salmon streams was satisfactory.

Pink and chum salmon runs in the Icy Strait and Western districts of the Juneau section were among the poorest on record, and the escapements of these species were light or entirely inadequate in most streams. The escapement of red salmon, however, was above average, and this species appears to be increasing in relative abundance in both districts. In the Eastern district of the Juneau section, including lower Chatham Strait, Frederick Sound, and Stephens Passage, the pink salmon run was good and most of the spawning areas were adequately seeded. The run of chums, although smaller than usual, was sufficient to provide an adequate escapement of this species.

In the Yakutat district better than average escapements of all species occurred in Dry Bay, Ahrnklin River, and Situk River, while good escapements were observed in Italio River and Lost River. This was accounted for in part by stormy weather and heavy rains, which curtailed commercial fishing operations. The pink salmon run in Humpback Creek was very light, but it is believed that a relatively good escapement occurred as a result of the curtailment of commercial operations there. It is felt that the excellent escapement in most sections of the Yakutat district may be nullified to a considerable extent by the destruction of spawn, owing to unusually heavy rains and flood conditions in the streams and rivers.

*Prince William Sound and Copper River region.*—The run of pink salmon in Prince William Sound was one of the poorest on record, and the annual survey of spawning streams revealed a corresponding deficiency in escapement. At no time was there a heavy sustained run in this section, and both run and escapement compared very unfavorably with the run and escapement of pinks in the previous cycle year of 1937. The Port Wells area had the poorest escapement of any section of the Sound, and the showing in streams on Hinchinbrook and Montague Islands was but little better. Streams in Chenega Bay, Jackpot Bay, Port Nellie Juan, and Culross Passage also were inadequately seeded, as were streams in Eaglek Bay and Long Bay. The escapement in Unakwik Inlet streams was fair but below normal. The best escapements occurred on the eastern side of Prince William Sound, particularly in the streams of Valdez Arm and Sheep Bay. Several streams in Port Fidalgo and in Port Gravina also had fair escapements.

The run and escapement of chums were of average proportions in this region. Observations on the red salmon spawning areas of Copper River reveal a better than average escapement of this species, due in part to a heavy early run that passed up the river prior to the commencement of commercial fishing operations.

*Cook Inlet.*—The run of red salmon, the principal species in this area, was one of the largest on record. Excellent escapements were observed in the Kenai and Kasilof River systems, where streams tributary to Kenai Lake and Tustumena Lake were well seeded. The English Bay stream received the largest escapement in many years, as indicated by the weir count for this stream, and the Kalgin Island stream also was adequately seeded. In Chinik Creek, however, the run was poor; the weir counts for that stream in the past few years having shown a steady decline.

As nearly as could be determined the escapement of kings was below normal, particularly in the Kenai River. Pinks were present in only small numbers, as was expected of the odd-year run of this species. The showing of pink salmon in Kachemak Bay was poor; however, most of the pinks that did appear were able to reach the spawning ground, as little effort was made to take them commercially. In the section between Point Gore and Seldovia the run and escapement were very light except in Port Dick, where an excellent run of pinks was observed.

*Kodiak area.*—The runs of red salmon were somewhat disappointing in the three red salmon sections of the Kodiak area, although the commercial take of this species was about average. The Red River run was very poor, and on July 22 this area was closed to commercial fishing for the remainder of the season to compensate for the lagging weir count. The escapement of red salmon was below normal in Karluk and Red Rivers but was generally satisfactory elsewhere.

The run of pink salmon did not appear in any volume during the first 6 weeks of the season but a very heavy late run appeared on the south shore of Kodiak Island near the end of the season. The escapement of this species was good in most streams, with the possible exception of certain sections of Afognak Island. The escapement of the three less important species, namely, chums, kings, and cohos, was at least of average proportions in most of the streams of the Kodiak area.

*Chignik.*—One of the best runs of red salmon in recent years occurred in the Chignik area in 1939, resulting in a near record pack and an excellent escapement of this species. A fair run and escapement of coho salmon was observed late in the season, while the showing of other species, as usual, was light.

*Alaska Peninsula.*—The red salmon which enter the commercial fishery of this area are for the most part migrating fish destined for spawning grounds in Bristol Bay. The escapement of local red salmon was light but probably of average proportions. Only fair escapements were reported in Bear and Sandy Rivers, on the north side of the Peninsula. The pink salmon did not appear in abundance until the last few days in July, but this run continued strong until after the close of the season. A survey of pink-salmon streams revealed excellent escapements in the streams between Isanotski Strait and Cape Swedania, while satisfactory escapements were reported also in the eastern section of the district, with the exception of streams in Stepovak Bay. The run and escapement of chum salmon also were satisfactory, although not so heavy as in other recent years.

*Bristol Bay.*—The red-salmon run in Bristol Bay as a whole was disappointing, with an especially weak showing in the important Kvichak-Naknek district. There was no concerted run except in the Nushagak district where a good early run of king salmon was followed by a strong sustained run of reds, lasting until about July 19. The Kvichak-Naknek run was light throughout the season, dropping off slowly after July 20. In the Egegik district the run was light, as it has been for the last few years, and in the relatively unimportant Ugashik district there was a better than average showing of red salmon.

Following the close of the fishing season extensive surveys of spawning grounds were made, partly by airplane. The Wood River lake system was very well seeded, but escapements in the Kvichak and Naknek watersheds were inadequate. Some streams in the Egegik watershed were fairly well seeded, especially those near the head of Becharof Lake, but as a whole the escapement in this district also was unsatisfactory. The escapement in the Ugashik district, while inadequate, was at least as good as in other recent years. In general it may be said that with few exceptions the seeding of streams in Bristol Bay was not satisfactory in 1939.

## GENERAL STATISTICS OF THE FISHERIES

The total number of persons engaged in the fisheries of Alaska in 1939 was 30,572, or 2,488 more than in 1938. Fishery products were valued at $40,104,493, a decrease of $2,765,233, or 6 percent, from the value in the preceding year. Of the total amount, 91 percent represented the value of salmon products; 5 percent, herring; 2 percent, halibut; and 2 percent, the value of all other fishery products.

*Summary of persons engaged and products of the Alaska fisheries in 1939*

| Item | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Number | Value | Number | Value | Number | Value | Number | Value |
| PERSONS ENGAGED | | | | | | | | |
| Whites | 7,452 | | 5,254 | | 5,340 | | 18,046 | |
| Natives | 3,613 | | 1,713 | | 1,371 | | 6,697 | |
| Chinese | 61 | | 105 | | 237 | | 403 | |
| Japanese | 386 | | 127 | | 253 | | 766 | |
| Filipinos | 1,371 | | 1,068 | | 1,270 | | 3,709 | |
| Mexicans | 24 | | 74 | | 548 | | 646 | |
| Puerto Ricans | 2 | | 17 | | 61 | | 78 | |
| Kanakas | | | 7 | | 35 | | 44 | |
| Negroes | 7 | | 26 | | 86 | | 119 | |
| Miscellaneous | | | 21 | | 43 | | 64 | |
| Total | 12,916 | | 8,412 | | 9,244 | | 30,572 | |
| PRODUCTS | | | | | | | | |
| Salmon: | | | | | | | | |
| Canned ... cases | 2,035,497 | $11,214,287 | 2,011,910 | $12,736,950 | 1,215,746 | $10,489,845 | 5,263,153 | $34,441,082 |
| Mild cured ... pounds | 5,776,800 | 1,084,176 | | | 132,800 | 17,000 | 5,909,600 | 1,101,176 |
| Pickled ... do | 23,000 | 1,769 | 243,400 | 26,323 | 56,000 | 6,029 | 322,400 | 34,121 |
| Fresh, for food ... do | 3,911,868 | 284,095 | 1,050 | 38 | | | 3,912,918 | 284,133 |
| Sharp-frozen for food ... do | 4,043,953 | 303,219 | | | | | 4,043,953 | 303,219 |
| Quick frozen fillets and steaks ... do | 122,135 | 21,984 | 186,626 | 14,930 | | | 308,761 | 36,914 |
| Fresh, for bait ... do | 24,603 | 200 | | | | | 24,603 | 200 |
| Frozen, for bait and mink feed ... do | 155,205 | 1,551 | | | | | 155,205 | 1,551 |
| Dry-salted ... do | | | 5,523 | 406 | 3,200 | 320 | 8,723 | 726 |
| Dried ... do | | | | | 456,000 | 36,500 | 456,000 | 36,500 |
| Smoked and canned ... cases | | | 179 | 1,441 | | | 179 | 1,441 |
| Meal ... pounds | 1,414,000 | 28,280 | 290,715 | 6,904 | | | 1,704,715 | 35,184 |
| Oil ... gallons | 58,040 | 17,412 | 10,675 | 4,270 | | | 68,715 | 21,682 |
| Herring: | | | | | | | | |
| Fresh, for bait ... pounds | 2,135,010 | 26,227 | 5,000 | 50 | | | 2,140,010 | 26,277 |
| Frozen, for bait ... do | 3,138,660 | 23,874 | | | | | 3,138,660 | 23,874 |
| Frozen, for fur farms ... do | 15,700 | 97 | | | | | 15,700 | 97 |
| Pickled, for food: | | | | | | | | |
| Scotch cure ... do | | | 2,233,563 | 153,413 | 624,300 | 31,678 | 2,857,863 | 185,091 |
| Norwegian cure ... do | | | 32,550 | 2,805 | | | 32,550 | 2,805 |
| Roused, for food (bloater stock) ... do | | | 169,890 | 4,074 | 338,400 | 10,764 | 508,290 | 14,838 |
| Dry-salted ... do | | | 63,200 | 5,080 | | | 63,200 | 5,080 |
| Meal ... do | 6,484.688 | 141,136 | 26,766,409 | 549,721 | | | 33,251,097 | 690,857 |
| Oil ... gallons | 821,639 | 203,906 | 3,946,944 | 937,648 | | | 4,768,583 | 1,141,554 |
| Halibut: | | | | | | | | |
| Fresh ... pounds | 7,082,658 | 513,611 | | | | | 7,082,658 | 513,611 |
| Sharp-frozen ... do | 6,344,678 | 375,191 | | | | | 6,344,678 | 375,191 |
| Quick-frozen fillets ... do | 27,135 | 4,884 | | | | | 27,135 | 4,884 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Livers ... do | 109,800 | 54,900 | | | | | 109,800 | 54,900 |
| Viscera ... do | 1,116 | 78 | | | | | 1,116 | 78 |
| Cod: | | | | | | | | |
| Dry-salted ... do | | | 32,358 | 1,599 | 140,000 | 8,046 | 172,358 | 9,645 |
| Pickled ... do | | | 100,536 | 4,953 | 27,115 | 1,952 | 127,651 | 6,905 |
| Stockfish ... do | | | 5,800 | 741 | | | 5,800 | 741 |
| Whale: | | | | | | | | |
| Oil ... gallons | | | | | 246,600 | 85,915 | 246,600 | 85,915 |
| Sperm oil ... do | | | | | 132,750 | 33,188 | 132,750 | 33,188 |
| Meal ... pounds | | | | | 1,002,000 | 17,428 | 1,002,000 | 17,428 |
| Sperm jawbone ... do | | | | | 8,200 | 410 | 8,200 | 410 |
| Clam: | | | | | | | | |
| Canned ... cases | 49 | 196 | 34,141 | 240,285 | | | 34,190 | 240,481 |
| Chowder ... do | | | 5 | 30 | | | 5 | 30 |
| Crab: | | | | | | | | |
| Canned meat: | | | | | | | | |
| Processed ... cases | 1,489 | 12,070 | 8,276 | 80,444 | | | 9,765 | 92,514 |
| Cold packed ... pounds | 890 | 445 | | | | | 890 | 445 |
| In bulk ... do | | | 63 | 30 | | | 63 | 30 |
| Whole in shell ... dozen | 341 | 682 | 310 | 908 | | | 651 | 1,590 |
| Shrimp: | | | | | | | | |
| Meat: | | | | | | | | |
| Canned ... cases | | | 40 | 400 | | | 40 | 400 |
| Cold packed ... pounds | 429,923 | 162,159 | 3,700 | 1,494 | | | 433,623 | 163,653 |
| Frozen ... do | 3,263 | 1,305 | | | | | 3,263 | 1,305 |
| Whole in shell ... do | 827 | 124 | | | | | 827 | 124 |
| Trout: | | | | | | | | |
| Canned ... cases | 8 | 40 | | | | | 8 | 40 |
| Fresh ... pounds | 25,611 | 2,208 | 4,400 | 396 | | | 30,011 | 2,604 |
| Frozen ... do | 15,966 | 1,168 | 8,800 | 792 | | | 24,766 | 1,960 |
| Sablefish: | | | | | | | | |
| Frozen ... do | 1,461,627 | 55,820 | | | | | 1,461,627 | 55,820 |
| Pickled ... do | 164,801 | 7,656 | | | | | 164,801 | 7,656 |
| Livers ... do | 73,033 | 31,142 | | | | | 73,033 | 31,142 |
| Viscera ... do | 13,870 | 971 | | | | | 13,870 | 971 |
| Rockfish: | | | | | | | | |
| Sharp frozen ... do | 32,239 | 757 | | | | | 32,239 | 757 |
| Quick frozen fillets ... do | 37,574 | 6,763 | | | | | 37,574 | 6,763 |
| Flounders: | | | | | | | | |
| Sharp frozen ... do | 8,400 | 504 | | | | | 8,400 | 504 |
| Quick frozen fillets ... do | 21,923 | 3,936 | | | | | 21,923 | 3,936 |
| "Lingcod": | | | | | | | | |
| Fresh ... do | 337 | 3 | | | | | 337 | 3 |
| Livers ... do | 753 | 301 | | | | | 753 | 301 |
| Oysters ... gallons | 52 | 166 | | | | | 52 | 166 |
| Total | | 14,589,293 | | 14,776,125 | | 10,739,075 | | [1] 40,104,493 |

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[1] These figures represent the value of the manufactured product. It is estimated that the value of the catch, exclusive of whales, to the fishermen was approximately $11,321,000. Of this amount, $9,256,000 was the value of the salmon catch. The round weight of the salmon catch landed by the fishermen was approximately 452,166,000 pounds, and the corresponding figure for herring was approximately 185,462,000 pounds. The cod figures given above do not include the offshore catch from waters adjacent to Alaska, which amounted to 3,062,000 pounds of dry-salted cod and 15,300 pounds of tongues, having a total value of $126,530, landed at ports of the Pacific Coast States.

## SALMON

A marked decline in the abundance of salmon was apparent in the 1939 season for Alaska as a whole, and particularly for the southeastern and western districts. In southeast Alaska the catch of every species was lighter than it had been for several years, and the total catch was the smallest obtained there since 1929. The catch in western Alaska, which consists chiefly of red salmon from the important Bristol Bay runs, was at the lowest level since 1935, notwithstanding an increase in the intensity of fishing.

In central Alaska, also, the catch was the smallest since 1935, although the decline was not as great as in the other two major districts, nor did it apply to all fishing areas. The most noticeable shortage occurred on Prince William Sound, where the run of pink salmon was exceptionally light. The Kodiak and Chignik areas, on the other hand, had good runs of pinks and reds, respectively, and the production of canned salmon in these two areas exceeded that of the preceding year. The pack for the Ikatan-Shumagin area was on about the same level as that of 1938, although containing a greater proportion of red salmon than for that year. The red salmon run in the Cook Inlet area was well above average, but the total pack showed a decline from that of 1938, owing to the light run of pinks and cohos. The unexpectedly small catch in the Copper River region was attributed to the delay in settlement of a price dispute between packers and fishermen, with the result that operations were not begun until a large part of the early run had passed upstream.

The total catch of salmon decreased 23 percent from that for 1938. By districts the decrease was 20 percent in southeast Alaska, about 8 percent in central, and about 44 percent in western Alaska.

There was an increase of about 3 percent in the number of fathoms of seines, and about 6 percent in the number of fathoms of gill nets used in Alaska in 1939, compared with the previous year. The number of traps decreased about 3 percent.

### Catch and Apparatus

The total number of seines used in the salmon industry in 1939 was 773, of which 665 were purse seines and 108 beach seines. The purse seines aggregated 104,553 fathoms of webbing, and the beach seines 10,431 fathoms. The number of gill nets used was 4,920, having a total length of 346,572 fathoms. There were 149 driven and 294 floating traps – a total of 443. This number does not include 2 traps in southeast Alaska that were taken out by storms before catching any fish. It does include, however, 17 traps in various parts of central Alaska that may be termed "dummy" traps, the catches of which were negligible.

Southeastern Alaska was credited with 466 seines, or a total of 82,468 fathoms, an increase of 19 seines and 8,993 fathoms of webbing over the number used in 1938; also with 434 gill nets, aggregating 29,555 fathoms, an increase of 7 nets and 1,330 fathoms of webbing; and with 23 driven and 262 floating traps, a decrease of 6 driven traps and an increase of 5 floating traps, as compared with the number operated in 1938.

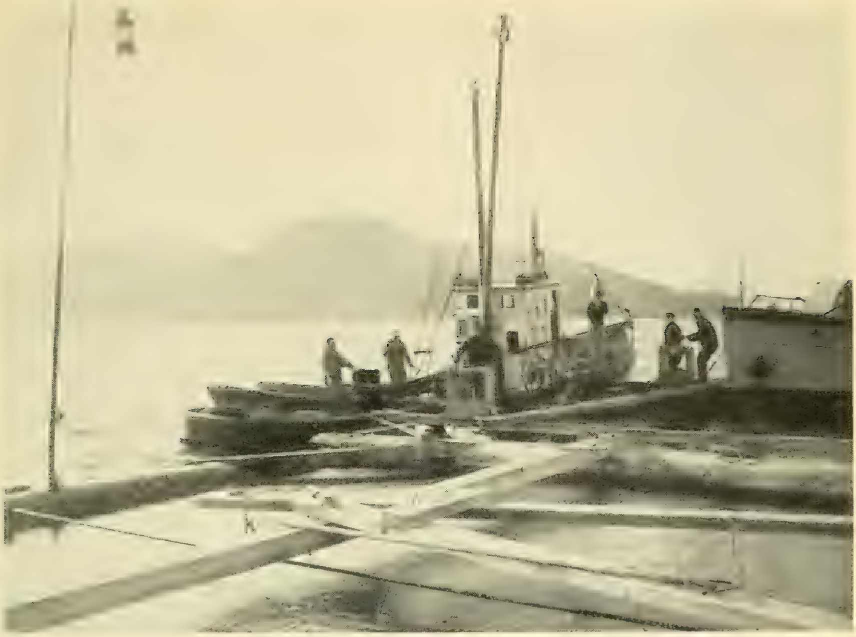

FIGURE 1.—Brailing salmon from a floating salmon trap into a tender, Alaska.

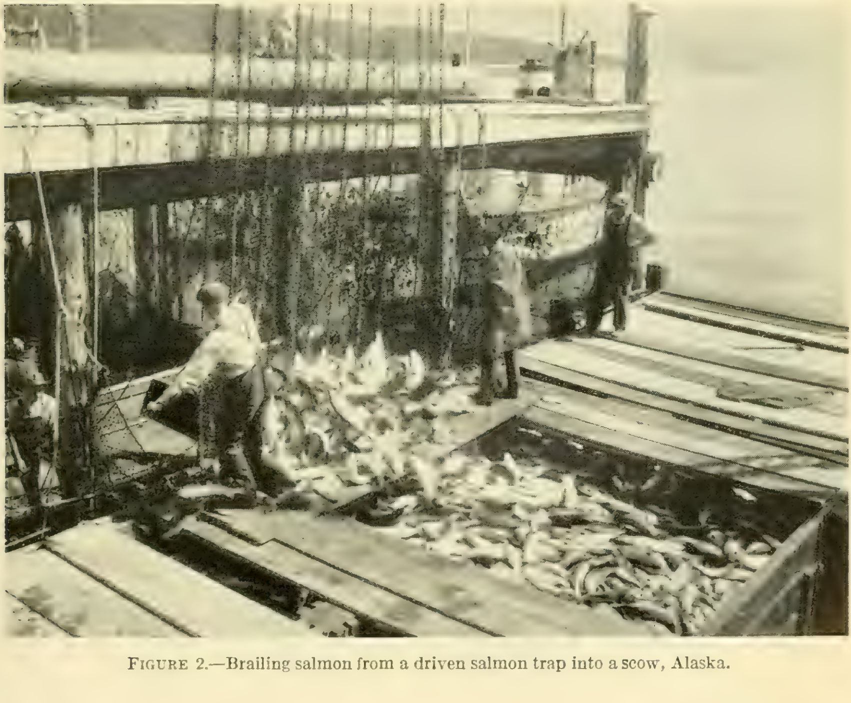

FIGURE 2.—Brailing salmon from a driven salmon trap into a scow, Alaska.

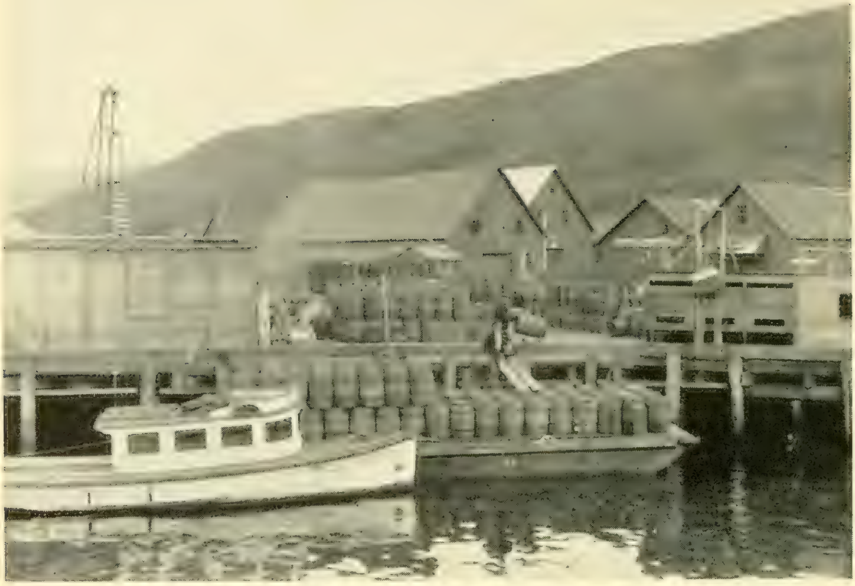

FIGURE 3.—Loading pickled herring at Unalaska, Alaska.

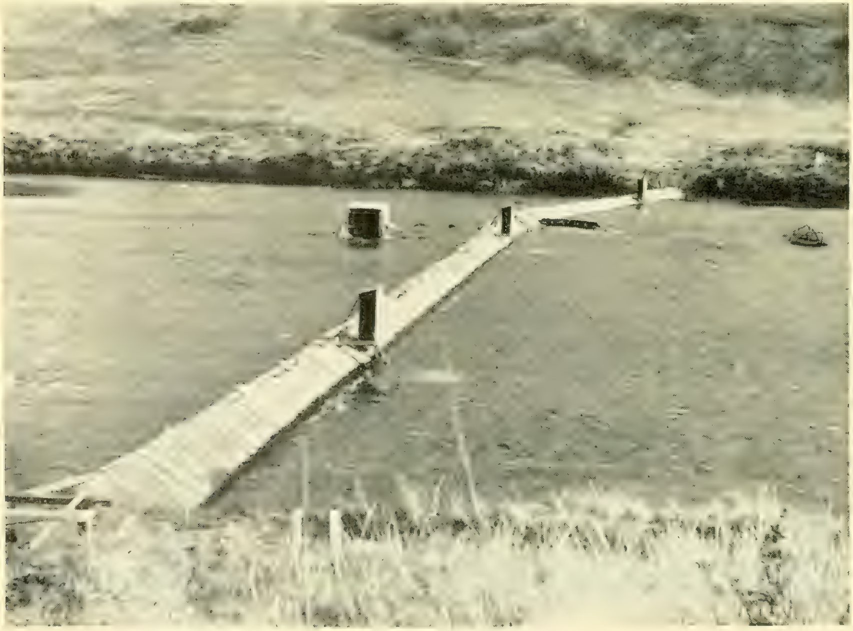

FIGURE 4.—Salmon-counting weir across the Karluk River, Alaska.

Corresponding figures for central Alaska show 304 seines, or 31,616 fathoms, as compared with 350 seines, or 37,054 fathoms, in 1938; 1,988 gill nets, or 121,578 fathoms, as compared with 2,072 gill nets, or 128,745 fathoms, in 1938; and 126 driven and 32 floating traps, as compared with 137 driven and 33 floating traps in 1938.

In western Alaska 3 seines, or 900 fathoms of webbing, were used, a decrease of 1 seine and 300 fathoms of webbing from the number operated in 1938. There were 2,498 gill nets used, or an aggregate of 195,439 fathoms, an increase of 286 nets and 24,760 fathoms of webbing. No traps were operated in this district.

Seines caught about 29 percent of the salmon taken in 1939, gill nets 23 percent, and traps 46 percent, while lines and wheels took the remaining 2 percent.

*Salmon traps operated in Alaska in 1939*

| Licensee | Territorial License No. | Location |
|---|---|---|
| Southeast Alaska: | | |
| Loveless & Sons, Inc | 39–003 | Marsh Island. |
| Do | 39–004 | Etolin Island. |
| Peril Straits Packing Co | 39–006 | Basket Bay. |
| Do | 39–007 | North of Fishery Point. |
| Do | 39–008 | Tebenkof Bay. |
| Do | 39–009 | Cosmos Cove. |
| Do | 39–010 | Marble Bluff. |
| Do | 39–011 | Peril Strait. |
| Do | 39–012 | North of Point Turbot. |
| Peter A. Miller | 39–013 | Kasaan Bay. |
| Independent Salmon Canneries, Inc | 39–016 | Indian Point. |
| Capp & Taylor Trap Co | 39–024 | Carroll Point. |
| Libby, McNeill & Libby | 39–034 | Cape Fanshaw. |
| Do | 39–035 | South of Limestone Inlet. |
| Do | 39–036 | Spasskaia Bay. |
| Do | 39–037 | Do. |
| Do | 39–038 | Do. |
| Do | 39–039 | Marble Cove. |
| Do | 39–040 | False Point Pybus. |
| Do | 39–041 | Windham Bay. |
| Do | 39–042 | Northeast of Point Pybus. |
| Do | 39–043 | Do. |
| Do | 39–044 | Cape Bendel. |
| Do | 39–045 | Fanshaw Bay. |
| Do | 39–046 | Wedge Island. |
| Do | 39–047 | Cone Island. |
| Do | 39–048 | Grindall Island. |
| Do | 39–049 | Niblack Point. |
| Do | 39–050 | Smugglers Cove. |
| Do | 39–051 | Thorne Arm. |
| Do | 39–052 | Sukkwan Island. |
| Do | 39–053 | Cape Lynch. |
| Do | 39–054 | Cap Island. |
| Do | 39–056 | San Christoval Channel. |
| Do | 39–057 | Suemez Island. |
| Do | 39–058 | Fern Point. |
| Do | 39–059 | Arucenas Point. |
| Do | 39–060 | San Christoval Channel. |
| The Nakat Packing Corporation | 39–061 | Tree Point. |
| Do | 39–071 | Rip Point. |
| Do | 39–072 | Scott Point. |
| Do | 39–075 | Kanagunut Island. |
| Do | 39–076 | Sitklan Island. |
| Do | 39–077 | Cape Fox Island. |
| Do | 39–078 | Tree Point South. |
| Do | 39–079 | Breakwater South. |
| Do | 39–080 | Breakwater North. |
| Do | 39–081 | Niblack Point. |
| Do | 39–082 | Tolstoi Point. |
| Do | 39–083 | Meyers Chuck. |
| Do | 39–084 | Ernest Point. |
| Do | 39–085 | Cape Ulitka. |
| Do | 39–086 | Eaton Point. |

*Salmon traps operated in Alaska in 1939*—Continued

| Licensee | Territorial License No. | Location |
|---|---|---|
| Southeast Alaska—Continued. | | |
| The Nakat Packing Corporation | [1] 39–087 | Gravina Island. |
| Do | 39–088 | Point Webster. |
| Do | 39–089 | Sukkwan Island. |
| Do | 39–090 | Point Providence. |
| Do | 39–091 | Tranquil Point. |
| Do | 39–092 | Blanquizal Island. |
| Do | 39–093 | Steamboat Point. |
| Do | 39–094 | Point Desconocida. |
| Do | 39–095 | Derrumba Ridge. |
| Arthur Gamble Trap Co | 39–096 | Tree Point. |
| Keller Trap Co | 39–097 | Foggy Point. |
| Gravina Packing Co | 39–098 | Boat Rock. |
| Dixon Entrance Fisheries Co | 39–099 | Meyers Island. |
| August Buschmann | 39–100 | Warren Island. |
| Do | 39–101 | Cape Addington. |
| Ira W. Kelly | 39–102 | Caamano Point. |
| Fidalgo Island Packing Co | 39–103 | Ship Island. |
| Do | 39–104 | Point Sykes. |
| Do | 39–105 | Slate Island. |
| Do | 39–106 | Onslow Island. |
| Do | 39–107 | Lucky Cove. |
| H. Bergman | 39–108 | North of Seal Cove. |
| Laura A. Houston | 39–109 | Point Higgins. |
| Fidalgo Island Packing Co | 39–110 | South of Kingsmill Point. |
| Do | 39–111 | Do. |
| Do | 39–112 | Point Ellis. |
| Do | 39–113 | South of Kingsmill Point. |
| Do | 39–114 | Kingsmill Point. |
| The Nakat Packing Corporation | 39–123 | Union Point. |
| Astoria & Puget Sound Canning Co | 39–124 | Pleasant Island. |
| Do | 39–125 | Big Porpoise Island. |
| Do | 39–126 | Point Adolphus. |
| Do | 39–127 | Do. |
| Do | 39–128 | Pleasant Island. |
| Pyramid Packing Co., Inc | 39–130 | Bradshaw Cove. |
| Deep Sea Salmon Co | [2] 39–133 | Caamano Point. |
| Do | [2] 39–134 | Bond Bay. |
| Do | [2] 39–135 | Hidden Point. |
| Martin Kildall | 39–150 | Cape Decision. |
| Do | 39–151 | Northeast of Cape Decision. |
| Alaska Pacific Salmon Co | 39–159 | East of Brownson Bay. |
| Do | 39–160 | Southeast of Point Webster. |
| Sebastian Stuart Fish Co | 39–162 | South of Point Brightman. |
| Do | 39–163 | North of Point Windham. |
| Do | 39–164 | Point Napean. |
| Do | 39–165 | South of Point Caution. |
| Do | 39–166 | South of Point League. |
| Do | 39–167 | East of Point Gardner. |
| F. H. Murphy & Co | 39–168 | Cleveland Peninsula. |
| Mrs. Dick Anderson | 39–175 | South of Windy Point. |
| P. E. Harris & Co | 39–187 | North of Hawk Inlet. |
| Do | 39–188 | Do. |
| Do | 39–189 | South of Point Marsden. |
| Do | 39–190 | North Shore of Icy Strait. |
| Do | 39–191 | South of Point Augusta. |
| Do | 39–192 | North of Hawk Inlet. |
| Do | 39–193 | North of Parker Point. |
| New England Fish Co | 39–195 | Carlson Cove. |
| Do | 39–196 | South Wilson Cove. |
| Do | 39–197 | Cosmos Cove. |
| Do | 39–198 | Point Thatcher. |
| Do | 39–199 | Peninsula Point. |
| Do | 39–204 | St. Philip Island. |
| Do | 39–205 | Turn Point, Tuxekan Island. |
| Do | 39–206 | San Fernando Island. |
| Do | 39–207 | Cape Lynch. |
| Do | 39–208 | San Christoval Channel. |
| Do | 39–209 | St. Ignace Island. |
| Do | 39–210 | Blank Point. |
| Do | 39–211 | Bronaugh Island. |
| Do | 39–212 | Nelson Cove. |
| Do | 39–213 | South Kendrick Bay. |
| Do | 39–214 | Point Adams. |

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[1] Licensee's interest in this trap was sold to C. D. Payne, and trap was jointly owned and operated by C. D. Payne and Pacific American Fisheries, Inc., in 1939 season.

[2] Trap sold to the Nakat Packing Corporation in spring of 1939 and operated by that organization during the season.

*Salmon traps operated in Alaska in 1939*—Continued

| Licensee | Territorial License No. | Location |
|---|---|---|
| Southeast Alaska—Continued. | | |
| J. H. Rolie & Co | 39-215 | South Kendrick Bay. |
| Brindle Trap Co | 39-216 | Flag Point. |
| Do | 39-217 | Duke Point. |
| Ward's Cove Packing Co | 39-218 | Seal Cove. |
| Do | 39-219 | Cone Point. |
| Alaska Pacific Salmon Co | 39-220 | Island Point. |
| E. R. Carlson | 39-231 | Sukkwan Island. |
| Eagle Trap Co | 39-244 | Percy Islands. |
| Gravina Trap Co | 39-245 | Gravina Island. |
| Superior Packing Co | 39-246 | Northwest of North Passage Point. |
| Alaska Pacific Salmon Co | 39-247 | Boulder Point. |
| Olaf A. Johnson | 39-248 | Warburton Island. |
| Peril Straits Packing Co | 39-249 | Cube Point. |
| Harry Selig | 39-250 | Dall Head. |
| Wm. M. Fraser | 39-251 | Steamer Rock. |
| R. Lindenberger | 39-252 | Point Garcia. |
| Do | 39-253 | Baker Island. |
| Ketchikan Packing Co | 39-257 | Southeast of South Vallenar Point. |
| Do | 39-258 | Do. |
| D. O. Jenkins | 39-262 | Revillagigedo Channel. |
| E. Dobszinsky | 39-266 | Clover Passage. |
| Pacific American Fisheries, Inc | 39-279 | Kah Shakes Cove. |
| Do | 39-280 | Do. |
| Do | 39-281 | Point Sykes. |
| Do | 39-282 | Lucky Cove. |
| Do | 39-283 | Betton Island. |
| Do | 39-284 | Escape Point. |
| Do | 39-285 | South Vallenar Point. |
| Do | 39-286 | Grindall Peninsula. |
| Do | 39-287 | Grindall Point. |
| Alaska Pacific Salmon Co | 39-288 | False Island. |
| Do | 39-289 | Polk Island. |
| Do | 39-290 | Cleveland Peninsula. |
| Do | 39-291 | West of Point Nunez. |
| Do | 39-292 | Shipwreck Point. |
| Do | 39-293 | Kassa Inlet. |
| Pacific American Fisheries, Inc | 39-294 | Kanagunut Island. |
| L. O. Gore and G. P. Jenkins | 39-295 | Brownson Bay. |
| Pacific American Fisheries, Inc | 39-296 | Point Colpoys. |
| Do | 39-297 | East of Point Baker. |
| Do | 39-298 | Deepwater Point. |
| Do | 39-299 | Point Hobart. |
| Do | 39-300 | Point Brightman. |
| Do | 39-301 | Port Beauclerc. |
| Do | 39-302 | Totem Bay. |
| O. W. Granquist | 39-303 | East of Point Baker. |
| Pacific American Fisheries, Inc | 39-304 | Rocky Point. |
| Do | 39-305 | Point Gustavus. |
| Do | 39-306 | Dundas Bay. |
| Do | 39-307 | Dundas Point. |
| Do | 39-308 | Lemesurier Island. |
| Do | 39-309 | Eagle Point. |
| Do | 39-310 | Mansfield Peninsula. |
| Do | 39-311 | Gull Cove. |
| Do | 39-332 | Point Alava. |
| Lynch Bros | 39-335 | North of Bond Bay. |
| J. V. Davis | 39-336 | Cape Bendel. |
| Do | 39-337 | Naked Island. |
| Do | 39-338 | East Point. |
| Columbia River Packers Association | 39-340 | Narrow Point. |
| Do | 39-341 | Northwest of Ratz Point. |
| Alaska Pacific Salmon Co | 39-366 | North of Cape Chacon. |
| Do | 39-367 | Do. |
| Do | 39-368 | McLean Point. |
| Do | 39-369 | Dall Head. |
| Do | 39-370 | Nelson Cove. |
| Do | 39-371 | Gravina Island. |
| Do | 39-372 | Boat Harbor. |
| Do | 39-373 | Street Island. |
| Do | 39-374 | Ship Island. |
| Do | 39-375 | Gravina Island. |
| Do | 39-376 | Northeast Inian Island. |
| Do | 39-377 | Northwest of Point Augusta Light. |
| Do | 39-378 | Point Sophia. |
| Do | 39-379 | Northwest of Rocky Island Light. |
| Do | 39-380 | West of Three Hill Island. |
| Do | 39-381 | Northwest Inian Island. |
| Do | 39-382 | South Inian Pass. |
| Do | 39-383 | Pleasant Island. |

*Salmon traps operated in Alaska in 1939*—Continued

| Licensee | Territorial License No. | Location |
|---|---|---|
| Southeast Alaska—Continued. | | |
| F. & W. Salmon Co | 39-387 | Island Point. |
| Lincoln Fisheries, Inc | 39-388 | Lucky Cove. |
| Do | 39-389 | Point Alava. |
| Scow Bay Packing Co | 39-391 | North of Labouchere Bay. |
| Do | 39-392 | North of Halibut Harbor. |
| Do | 39-393 | East of Point Baker. |
| Do | 39-394 | West of Point Baker. |
| Pyramid Packing Co., Inc | 39-395 | Distant Point. |
| Do | 39-396 | South of Point Kakul. |
| Do | 39-397 | Do. |
| Alaska Pacific Salmon Co | 39-398 | South of Point Hepburn. |
| Do | 39-399 | Point Hepburn. |
| Do | 39-400 | Village Point. |
| Do | 39-401 | Mansfield Peninsula. |
| Do | 39-402 | South of Funter Bay. |
| Do | 39-403 | North of Village Point. |
| Do | 39-404 | Northwest of Rocky Island Light. |
| Do | 39-405 | False Bay. |
| Do | 39-406 | Cube Point. |
| Do | 39-407 | Square Cove. |
| Do | 39-408 | Hawk Inlet. |
| Do | 39-409 | Deepwater Point. |
| Do | 39-410 | Point Hobart. |
| Do | 39-411 | Northeast of Point Pybus. |
| Do | 39-412 | Canoe Point. |
| Do | 39-413 | Point Macartney. |
| Do | 39-414 | Cape Fanshaw. |
| Do | 39-415 | Cornwallis Point. |
| Do | 39-416 | Herring Bay. |
| Do | 39-417 | Point Barrie. |
| Do | 39-418 | Point Brightman. |
| Do | 39-422 | McLeod Bay. |
| Do | 39-423 | Nutkwa Inlet. |
| Do | 39-424 | West of Point Nunez. |
| Do | 39-425 | Northwest of Kaigani Point. |
| Do | 39-426 | Cape Muzon. |
| Do | 39-427 | Cordova Bay. |
| Do | 39-428 | Bean Island. |
| C. D. Payne | 39-429 | Chasina Point. |
| Grover C. Winn | 39-430 | Point Brightman. |
| Otto Anderson | 39-431 | Vallenar Point. |
| Brindle Trap Co | 39-432 | Gravina Island. |
| Anderson & Peterson Trap Co | 39-433 | Tongass Island. |
| James Taylor Trap Co | 39-434 | Kendrick Bay. |
| Ward's Cove Packing Co | 39-435 | Gravina Island. |
| Hugh Pinkerton | 39-442 | Bond Bay. |
| W. S. Balcom | 39-443 | Island Point. |
| Do | 39-444 | Cape Chacon. |
| Pacific American Fisheries, Inc., and E. Schoenwald. | 39-445 | Point Nesbitt. |
| Superior Packing Co | 39-446 | South Passage Point. |
| Do | 39-447 | Marble Bluff. |
| Do | 39-448 | False Bay. |
| Do | 39-449 | North of Parker Point. |
| Otto Bindpage | 39-450 | Kelp Island. |
| Beegle Packing Co | 39-451 | South of Foggy Point. |
| Do | 39-452 | Dall Head. |
| Do | 39-453 | Cape Fox. |
| Do | 39-454 | Black Island. |
| Ole Gunderson & Sons | 39-455 | Screen Islands. |
| Do | 39-456 | Etolin Island. |
| Hood Bay Canning Co | 39-458 | Point Caution. |
| Do | 39-459 | South of Distant Point. |
| Do | 39-460 | South of Basket Bay. |
| Do | 39-461 | Killisnoo Island. |
| MacKenzie Fish Co | 39-466 | Caamano Point. |
| Farwest Fishermen, Inc | 39-468 | Observation Island. |
| Do | 39-469 | Steamer Point. |
| Do | 39-470 | Olson Cove. |
| Do | 39-471 | Point Amelius. |
| Wrangell Packing Co | 39-475 | Northwest of Ratz Point. |
| Do | 39-476 | East Island. |
| G. C. Foster | 39-477 | Ratz Point. |
| Annette Island Canning Co., 8 traps [3] | --- - -- | Annette Island Fishery Reserve. |
| Prince William Sound: | | |
| Pacific American Fisheries, Inc | 39-141 | Point Freemantle. |
| Do | 39-142 | Point Woodcock. |
| Do | 39-143 | Graveyard Point. |

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[3] Operated on behalf of the Metlakatla Indians who reside within the limits of the Annette Island Fishery Reserve.

*Salmon traps operated in Alaska in 1939*—Continued

| Licensee | Territorial License No. | Location |
|---|---|---|
| Prince William Sound—Continued. | | |
| Pacific American Fisheries, Inc | 39-144 | Bidarka Point. |
| Do | 39-145 | Bligh Island. |
| Pioneer Canneries, Inc | 39-169 | Makaka Point. |
| Do | 39-170 | Bligh Island. |
| Do | 39-171 | North of Point Freemantle. |
| Pioneer Sea Foods Co | 39-172 | Eagle Point, Hinchinbrook Island. |
| Do | 39-173 | Hinchinbrook Island. |
| Do | 39-174 | Cedar Bay. |
| Premier Salmon Co | 39-176 | Port Etches. |
| Do | 39-177 | Fidalgo Bay. |
| Do | 39-178 | Knowles Head. |
| New England Fish Co | 39-200 | Johnstone Point. |
| Do | 39-201 | Gravina Point. |
| Do | 39-202 | Hawkins Cutoff. |
| Do | 39-203 | Graveyard Point. |
| Shepard Point Packing Co | 39-223 | Port Fidalgo. |
| Do | 39-224 | Bainbridge Island. |
| Do | 39-225 | Montague Island. |
| Do | 39-226 | Do. |
| Do | 39-227 | Do. |
| Do | 39-228 | Knight Island. |
| Do | 39-229 | Shelter Bay. |
| Do | 39-230 | Red Head. |
| Copper River Packing Co | 39-232 | Chenega Island. |
| Do | 39-233 | Do. |
| Do | 39-234 | Do. |
| Do | 39-235 | Do. |
| Do | 39-236 | Culross Island. |
| San Juan Fishing & Packing Co | 39-267 | Knight Island. |
| Do | 39-268 | Chenega Island. |
| Do | 39-269 | Point Helen. |
| Do | 39-270 | Do. |
| Do | 39-271 | Port Chalmers. |
| Do | 39-272 | Squire Island. |
| Do | 39-275 | Rocky Point. |
| Do | 39-276 | McLeod Harbor. |
| Shepard Point Packing Co | 39-339 | Montague Island. |
| B. E. Lee | 39-354 | Granite Bay. |
| King & Crooker | 39-457 | Hinchinbrook Island. |
| Cook Inlet: | | |
| Libby, McNeill & Libby | 39-025 | Corea Bend. |
| Do | 39-026 | Ninilchik Point. |
| Do | 39-027 | Porcupine. |
| Do | 39-028 | Salamato. |
| Do | 39-029 | Kalifonski. |
| Do | 39-030 | Southwest of Cape Kasilof. |
| Do | 39-031 | Moose. |
| Do | 39-033 | Salamato. |
| Fidalgo Island Packing Co | 39-115 | Bluff Point. |
| Do | 39-116 | Salamato Beach. |
| Do | 39-117 | Do. |
| Do | 39-119 | South of Cape Kasilof. |
| Do | 39-120 | Boulder Point. |
| Do | 39-121 | Southwest of Point Naskowak. |
| Do | 39-122 | Nubble Point. |
| Anton Johnson & Harold Jonsson | 39-129 | Salamato Beach. |
| Paul A. Shadura | 39-221 | Kalifonski Beach. |
| Tyonek Native Store Association | 39-261 | Moquawkie Reservation. |
| General Fish Co., Inc | 39-277 | South of Three Mile Creek. |
| Do | 39-278 | North of Three Mile Creek. |
| Pacific American Fisheries, Inc | 39-316 | East shore of Cook Inlet. |
| Do | 39-317 | Do. |
| Do | 39-318 | South of Salamato. |
| Do | 39-319 | North of Kenai. |
| Snug Harbor Packing Co | 39-344 | Kalgin Island. |
| Do | 39-345 | Do. |
| Do | 39-346 | East shore Cook Inlet. |
| E. J. Fribrock | 39-347 | Do. |
| Do | 39-349 | Salamato. |
| Sig Lindgren | 39-351 | East shore Cook Inlet. |
| M. M. Everett | 39-352 | Trading Bay. |
| Do | 39-353 | Do. |
| Cook Inlet Packing Co | 39-355 | North of Ninilchik River. |
| Do | 39-356 | East shore Cook Inlet. |
| Do | 39-357 | Do. |
| Do | 39-358 | Do. |
| Do | 39-359 | Do. |
| Do | 39-360 | Do. |
| Do | 39-361 | Do. |

*Salmon traps operated in Alaska in 1939*—Continued

| Licensee | Territorial License No. | Location |
|---|---|---|
| Cook Inlet—Continued. | | |
| Kenai River Packing Co | 39-362 | East shore Cook Inlet. |
| Do | 39-363 | Do. |
| J. T. Hansen | 39-364 | Nikishka Bay. |
| Oscar H. Vogel | 39-436 | Point Possession. |
| Alaska Year Round Canneries Co | 39-462 | Clam Gulch, Kenai Peninsula. |
| Do | 39-463 | Kalgin Island. |
| Do | 39-464 | Do. |
| Do | 39-465 | Corea Bend. |
| Ninilchik Packing Co | 39-472 | Southwest of Anchor Point. |
| Do | 39-473 | Southwest of Ninilchik. |
| Emard Packing Co | 39-479 | Moose Point. |
| Do | 39-480 | Southwest of Moose Point. |
| Do | 39-482 | North of Moose Point. |
| Kodiak Area: | | |
| San Juan Fishing & Packing Co | 39-017 | Malina Point. |
| Alaska Packers Association | 39-062 | Miller Island. |
| Do | 39-063 | Alitak Bay. |
| Do | 39-064 | Deadman Bay. |
| Do | 39-068 | Uyak Bay. |
| Do | 39-069 | Do. |
| Do | 39-070 | Do. |
| Kadiak Fisheries Co | 39-136 | Raspberry Island. |
| Do | 39-137 | Do. |
| Do | 39-138 | Do. |
| Do | 39-139 | Viekoda Bay. |
| Do | 39-140 | Raspberry Island. |
| Pacific American Fisheries, Inc | 39-194 | Alitak Bay. |
| San Juan Fishing & Packing Co | 39-239 | Malina Bay. |
| Pacific American Fisheries, Inc | 39-259 | Deadman Bay. |
| Do | 39-260 | Alitak Bay. |
| Uganik Fisheries, Inc | 39-263 | Uganik Island. |
| Do | 39-264 | Do. |
| Do | 39-265 | Raspberry Island. |
| San Juan Fishing & Packing Co | 39-273 | South of Broken Point. |
| Do | 39-274 | Uganik Island. |
| Pacific American Fisheries, Inc | 39-312 | Chief Point. |
| Do | 39-313 | South of Cape Kuliuk. |
| Ottar Hofstad | 39-333 | Cape Ugat. |
| Do | 39-334 | Cape Uyak. |
| Chignik Area: | | |
| Columbia River Packers Association | 39-020 | Chignik Bay. |
| Do | 39-021 | Aniakchak Bay. |
| Do | 39-022 | Lake Bay. |
| Alaska Packers Association | 39-065 | Main Island, Chignik Lagoon. |
| Do | 39-066 | West end of Chignik Bay. |
| Do | 39-067 | Cape Kumlik. |
| Pacific American Fisheries, Inc | 39-314 | Humes Point. |
| Do | 39-315 | Hook Bay. |
| Alaska Peninsula Area: | | |
| Alaska Southern Packing Co | 39-131 | Fox Cape. |
| Do | 39-132 | Kupreanof Point. |
| Pacific American Fisheries, Inc | 39-146 | Kelley Rock, Unga Island. |
| Do | 39-147 | Pinnacle, Unga Island. |
| Do | 39-148 | Swedania Point. |
| Do | 39-149 | Seal Cape. |
| P. E. Harris & Co | 39-179 | Cape Horn. |
| Do | 39-180 | East Anchor Cove. |
| Do | 39-181 | Ikatan Bay. |
| Do | 39-182 | Do. |
| Do | 39-183 | Arch Point. |
| Do | 39-184 | Pavlof Bay. |
| Do | 39-185 | Do. |
| Do | 39-186 | Moss Cape. |
| Pacific American Fisheries, Inc | 39-320 | Ikatan Bay. |
| Do | 39-321 | Do. |
| Do | 39-322 | Do. |
| Do | 39-323 | Do. |
| Do | 39-324 | Morzhovoi Bay. |
| Do | 39-325 | Vodapoini Point. |
| Do | 39-326 | Nikolaski, Moss Cape. |
| Do | 39-327 | Deer Island. |
| Do | 39-328 | Lohn John, north of Arch Point. |
| Do | 39-329 | Dolgoi Island. |
| Do | 39-330 | Cape Tolstoi. |
| D. Hotovitzky | 39-331 | Bold Cape. |
| Korovin Island Fishing & Canning Co | 39-384 | Korovin Island. |
| Alaska Pacific Salmon Co | 39-385 | Popof Island. |
| Mrs. Helene R. Mellick | 39-386 | Do. |
| Aleutian Fishing & Packing Co | 39-390 | San Diego, west of Guillemot Island. |
| Blue Fox Fish Co | 39-437 | Popof Island. |

*Summary of traps operated in Alaska in 1939, by districts*

| District | Number | District | Number |
|---|---|---|---|
| Southeast Alaska | [1] 285 | Central Alaska—Continued | |
| Central Alaska: | | Alaska Peninsula Area | 31 |
| Prince William Sound | 42 | Total, Central Alaska | 158 |
| Cook Inlet | 52 | Grand total | 443 |
| Kodiak Area | 25 | | |
| Chignik Area | 8 | | |

[1] Two additional traps in southeast Alaska were installed but were taken out by storm before any catch was obtained. These traps were No. 39-243 of the Security Fish Co. at Security Point, Dall Island, and No. 39-467 of Farwest Fishermen, Inc., at Kingsmill Point.

*Percentage of salmon caught in each Alaska district, by principal forms of apparatus*

| Apparatus | Southeast Alaska | | Central Alaska | | Western Alaska | |
|---|---|---|---|---|---|---|
| | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 |
| Seines | 27 | 29 | 32 | 40 | 3 | 4 |
| Gill nets | 2 | 3 | 10 | 10 | 96 | 94 |
| Traps | 67 | 65 | 58 | 50 | | |
| Lines | 4 | 3 | | | | |
| Wheels | | | | | 1 | 2 |

The total catch of salmon in 1939 was 79,220,420, a decrease of 23,802,477, or 23 percent, from the number taken in 1938. There was a decrease of 8,964,683 in southeast, 2,707,895 in central, and 12,129,899 in western Alaska. By species, the catch of cohos decreased 1,457,081, chums 979,456, pinks 10,534,607, kings 110,099, and reds 10,721,234.

*Salmon taken in 1939, by apparatus and species, in each geographic section of Alaska*

| Apparatus and species | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| Seines: | | | | |
| Coho, or silver | 128,419 | 59,612 | | 188,031 |
| Chum, or keta | 1,734,549 | 1,156,407 | 77,942 | 2,968,898 |
| Pink, or humpback | 6,691,004 | 10,784,854 | 16 | 17,475,874 |
| King, or spring | 1,575 | 2,813 | 3,270 | 7,658 |
| Red, or sockeye | 692,875 | 990,038 | 610,111 | 2,293,024 |
| Total | 9,248,422 | 12,993,724 | 691,339 | 22,933,485 |
| Gill nets: | | | | |
| Coho, or silver | 162,255 | 112,016 | 1,028 | 275,299 |
| Chum, or keta | 22,100 | 118,779 | 1,069,338 | 1,210,217 |
| Pink, or humpback | 82,552 | 614,354 | 48 | 696,954 |
| King, or spring | 6,708 | 46,123 | 55,039 | 107,870 |
| Red, or sockeye | 521,603 | 2,159,410 | 13,484,436 | 16,165,449 |
| Total | 795,218 | 3,050,682 | 14,609,889 | 18,455,789 |
| Traps: | | | | |
| Coho, or silver | 453,005 | 278,373 | | 731,378 |
| Chum, or keta | 1,629,801 | 1,467,262 | | 3,097,063 |
| Pink, or humpback | 16,947,566 | 9,542,243 | | 26,489,809 |
| King, or spring | 3,860 | 36,690 | | 40,550 |
| Red, or sockeye | 1,272,668 | 4,883,468 | | 6,156,136 |
| Total | 20,306,900 | 16,208,036 | | 36,514,936 |
| Lines: | | | | |
| Coho, or silver | 378,504 | | | 378,504 |
| Chum, or keta | 2,309 | | | 2,309 |
| Pink, or humpback | 834 | | | 834 |
| King, or spring | 639,923 | | | 639,923 |
| Total | 1,021,570 | | | 1,021,570 |

*Salmon taken in 1939, by apparatus and species, in each geographic section of Alaska*—Continued

| Apparatus and species | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| Wheels: | | | | |
| Chum, or keta | | | 272,050 | 272,050 |
| King, or spring | | | 21,590 | 21,590 |
| Red, or sockeye | | | 1,000 | 1,000 |
| Total | | | 294,640 | 294,640 |
| Total: | | | | |
| Coho, or silver | 1,122,183 | 450,001 | 1,028 | 1,573,212 |
| Chum, or keta | 3,388,759 | 2,742,448 | 1,419,330 | 7,550,537 |
| Pink, or humpback | 23,721,956 | 20,941,451 | 64 | 44,663,471 |
| King, or spring | 652,066 | 85,626 | 79,899 | 817,591 |
| Red, or sockeye | 2,487,146 | 8,032,916 | 14,095,547 | 24,615,609 |
| Grand total | 31,372,110 | 32,252,442 | 15,595,868 | 79,220,420 |

## CANNING

### CHANGES IN CANNERIES

In southeast Alaska the Alaska Pacific Salmon Co. closed its Rose Inlet cannery and in lieu thereof leased and operated the Kasaan plant of Pacific American Fisheries, Inc., which had been used as a clam cannery in 1938. The Petersburg cannery of the Pacific American Fisheries, Inc., was leased and operated by the Petersburg Canning Co., a new organization headed by A. W. Brindle, of the Ward's Cove Packing Co. The cannery formerly owned by the Diamond K Packing Co. at Wrangell was operated under lease by the Farwest Fishermen, Inc. The latter subsequently purchased the plant after it had been acquired by the Pacific American Fisheries, Inc., at marshal's sale.

The plant of the Bayview Packing Co. at Klawak, which had been leased to the Ocean Packing Co. in 1933 and operated by that company for a number of years, was taken over and operated by R. J. Peratrovich & Son. Operations at the Excursion Inlet plant of the Astoria & Puget Sound Canning Co. were carried on under the company's own name, rather than as the Consolidated Fisheries, by which this plant had been designated since 1935. The plant of Dean C. Kayler at Petersburg, which had handled only crabs and shrimp in 1938, was used also as a salmon cannery in the 1939 season.

A modern 2-line cannery was built at Hydaburg to replace that of the Hydaburg Fisheries, Inc., which had been idle in the previous year. This construction was financed through a Government loan obtained under the Indian Reorganization Act by an association of Hydaburg natives. The association entered into a contract with W. A. Pries, head of the Annette Island Canning Co., for operation of the plant as the Hydaburg Canning Co. under a 5-year lease somewhat similar to that in effect with respect to the Annette Island Canning Co. at Metlakatla.

The plant heretofore known as that of L. Utness at Mountain Slough was operated during the season as the Crystal Falls Fish Co. A new organization, known as the Far North Packing & Shipping Co., leased the floating plant *Commander*, formerly owned by Suryan's Inc., and operated it at Moser Bay. The Red Mountain Packers, Inc., took over and operated the plant of the Puget & Alaska Canning Co. at Seldovia.

The following canneries that had been idle in the previous year were reopened in 1939: Berg Packing Co., Ketchikan; Hood Bay Canning Co., Hood Bay; Pyramid Packing Co., Inc., Sitka; Kadiak Fisheries Co., Shearwater Bay; Pacific American Fisheries, Inc., King Cove; Alaska Packers Association, at Nushagak and Ugashik; Alaska Salmon Co., Wood River; and Pacific American Fisheries, Inc., at Nushagak and Port Moller.

### NEW CANNERIES

The Salt Sea Fisheries, which put up a small pack of salmon at Tenakee Springs in 1938 in conjunction with the canning of crabs expanded its salmon canning operations in 1939 and is included for the first time in the list of salmon canneries. Similarly, the plant of the Alaskan Glacier Sea Food Co. at Bering River, established in 1938 for the canning of crabs, was engaged chiefly in salmon canning this season and is listed as a salmon cannery.

A new organization, the Intercoastal Packing Co., equipped the steamer *Ogontz* (3,127 tons net) with two high speed lines of salmon canning machinery and operated it both at Naknek and at Kupreanof Harbor during the 1939 season. Young & Trones operated a small hand cannery, consisting of a single half-pound line, aboard a scow on Eyak River.

A new 4-line cannery at Naknek, the construction of which was begun in the fall of 1938 by the Thompson Salmon Co., a subsidiary of the Columbia River Packers Association, was completed and operated under lease by the latter company.

In addition, there were small packs of salmon incidental to other fisheries products by the following companies which are not listed among the salmon canneries; Nickey Clam & Salmon Cannery, Ketchikan; Enterprise Sea Food Co., Ninilchik; King Crab Co., Kachemak Bay; Nunez Bros. Packing Corporation, Cordova; Sheep Bay Mill & Packing Co., Sheep Bay; and the Northern Commercial Co., Pastolik.

### CANNERIES NOT OPERATED

The Scow Bay Packing Co. did not operate its plant at Scow Bay, and its trap-caught fish were canned by the Petersburg Canning Co. No salmon were packed by the Gulf Packing Co. at Cordova in 1939, the plant being used exclusively for the canning of crabs. The cannery of the Pioneer Sea Foods Co. at Orca was not operated, and the catch of the company's traps was canned by the New England Fish Co. at Cordova under a joint operating agreement. Other plants that had canned salmon in Alaska in the previous year but were not operated in 1939 were the floating plant of Lars Sagen, on Crescent River; the Anchor Line Packing Co., Kenai River; and the Great Northern Packing Co., Inc., Uyak Bay.

The old cannery of the Shelikof Packing Co. at Zachar Bay, which had been leased to the Kadiak Fisheries Co. in 1937 and which was idle in 1938, was purchased by the Chatham Strait Fish Co. and remodeled and used as a herring reduction plant.

The following plants have been dropped from the list of idle canneries, as they have been dismantled or abandoned and are not likely to be reopened: The cannery of Karl Thiele, at Lake Bay, which was last operated by the Columbia River Packers Association in 1930; the Aleutian Fishing and Packing Co. at Sand Point, which was last operated in 1936; the Pacific American Fisheries, Inc., plant at Nushagak River, which was last operated by Lowe Trading Co. in 1936; plants of Libby, McNeill & Libby at Nushagak and Lockanok, last operated in 1936, the latter of which was abandoned on account of the formation of a mud flat off its dock preventing access by scows and other boats; the old cannery of the Red Salmon Canning Co. at Naknek Village, which was last operated in 1930; and the floating cannery which was last operated in 1937 by the Western Pacific Packing Co. at Egegik and which has been taken over by the Pacific American Fisheries, Inc.

In the following list of canneries which were inactive in 1939 but which may be reopened there is shown after each plant the year in which it was last operated:

| | |
|---|---|
| Southeast Alaska: | |
| Alaska Pacific Salmon Co | Boca de Quadra (1928).<br>Chomly (1930).<br>Funter Bay (1930).<br>Pybus Bay (1928).<br>Rose Inlet (1938). |
| Deep Sea Salmon Co | Skowl Arm (1937). |
| Lane Bros | Moira Sound (1936). |
| New England Fish Co | Chatham (1937). |
| Red Salmon Packers Association | Yakutat (floating) (1937). |
| Scow Bay Packing Co | Scow Bay (1938). |
| Seaport Salmon Co | Ketchikan (1936). |
| Central Alaska: | |
| Alaska Packers Association | Chignik (1931). |
| Anchor Line Packing Co | Kenai River (1938). |
| Glacier Sea Foods Co | Cordova (1936). |
| Great Northern Packing Co., Inc | Uyak Bay (1938). |
| Ninilchik Packing Co | Ninilchik (1936). |
| Pacific American Fisheries, Inc | Kenai (1931). |
| Phillips Canning Corporation | Valdez (1937). |
| Pioneer Sea Foods Co., The | Orca (1938). |
| Premier Salmon Co | Stevens Creek (1936). |
| Shepard Point Packing Co | Shepard Point (1937). |
| Western Alaska: | |
| Alaska Packers Association | Naknek River (1929). |
| Herendeen Bay Consolidated Canneries | Herendeen Bay (1932). |

## TOTAL CANNERIES OPERATED

One hundred and nine canneries were operated in Alaska in 1939—44 in southeastern, 41 in central, and 24 in western Alaska, which is an increase over the previous year of 5 for the southeastern and 6 for the western district, and no change in number for central Alaska. The floating canneries *La Merced* (1,938 tons), of the Alaska Southern Packing Co., Inc., *International* (1,760 tons), of the International Packing Co., *Memnon* (2,154 tons), of the Columbia River Packers Association, Inc., and *Ogontz* (3,127 tons), of the Intercoastal Packing Co., were operated in both central and western Alaska, but each is credited to only one district, the *La Merced* and *International* to central Alaska, and the others to western Alaska.

*Companies that canned salmon in Alaska, number and location of canneries operated, and number of traps owned by each, 1939*

[New canneries indicated by asterisk (*)]

| Company | Canneries | | Traps | | |
|---|---|---|---|---|---|
| | Number | Location | Driven | Floating | Total |
| Southeast Alaska: | | | | | |
| Alaska Pacific Salmon Co | 4 | Kake | ------ | 11 | 11 |
| | | Kasaan | ------ | ------ | ------ |
| | | Ketchikan | 5 | 16 | 21 |
| | | Port Althorp | ------ | 19 | 19 |
| Annette Island Canning Co | 1 | Metlakatla | 1 | 7 | 8 |
| A R B Packing Co | 1 | Wrangell | ------ | ------ | ------ |
| Astoria & Puget Sound Canning Co | 1 | Excursion Inlet | 3 | 10 | 13 |
| Balcom-Payne Fisheries, Inc | 1 | Ketchikan | ------ | ------ | ------ |
| Beegle Packing Co | 1 | do | ------ | 6 | 6 |
| Berg Packing Co | 1 | do | ------ | ------ | ------ |
| Burnett Inlet Salmon Co | 1 | Burnett Inlet | ------ | ------ | ------ |
| Douglas Fisheries Co., Inc | 1 | Douglas | ------ | ------ | ------ |
| Farwest Fishermen, Inc | 1 | Wrangell | ------ | 6 | 6 |
| Fidalgo Island Packing Co | 2 | Bay of Pillars | 5 | ------ | 5 |
| | | Ketchikan | 2 | 3 | 5 |
| Haines Packing Co | 1 | Letnikof Cove | ------ | ------ | ------ |
| P. E. Harris & Co | 1 | Hawk Inlet | ------ | 7 | 7 |
| Hood Bay Canning Co | 1 | Hood Bay | ------ | 4 | 4 |
| Hydaburg Canning Co | 1 | Hydaburg | ------ | ------ | ------ |
| Icy Straits Salmon Co | 1 | Hoonah | ------ | ------ | ------ |
| Independent Salmon Canneries, Inc | 1 | Ketchikan | ------ | 1 | 1 |
| Dean C. Kayler | 1 | Petersburg | ------ | ------ | ------ |
| Ketchikan Packing Co | 1 | Ketchikan | ------ | 2 | 2 |
| Libby, McNeill & Libby | 4 | Craig | ------ | 8 | 8 |
| | | George Inlet | ------ | 6 | 6 |
| | | Taku Harbor | 2 | 10 | 12 |
| | | Yakutat | ------ | ------ | ------ |
| Lindenberger Packing Co | 1 | Craig | ------ | ------ | ------ |
| Nakat Packing Corporation, The | 3 | Hidden Inlet | ------ | 7 | 7 |
| | | Union Bay | ------ | 11 | 11 |
| | | Waterfall | ------ | 9 | 9 |
| New England Fish Co | 2 | Ketchikan | ------ | 5 | 5 |
| | | Noyes Island | ------ | 6 | 6 |
| Northern Fisheries, Inc | 1 | Ketchikan | ------ | ------ | ------ |
| R. J. Peratrovich & Son | 1 | Klawak | ------ | ------ | ------ |
| Peril Straits Packing Co | 1 | Todd | ------ | 7 | 7 |
| Petersburg Canning Co | 1 | Petersburg | 3 | 4 | 7 |
| Pyramid Packing Co., Inc | 1 | Sitka | ------ | 4 | 4 |
| Salt Sea Fisheries | 1 | Tenakee Springs * | ------ | ------ | ------ |
| Sebastian Stuart Fish Co | 1 | Tyee | ------ | 6 | 6 |
| Spencer Packing Co | 1 | Klawak | ------ | ------ | ------ |
| Superior Packing Co | 1 | Tenakee | ------ | 5 | 5 |
| Ward's Cove Packing Co | 1 | Ward Cove | ------ | 3 | 3 |
| Wrangell Packing Co | 1 | Wrangell | ------ | 2 | 2 |
| Central Alaska: | | | | | |
| Alaskan Glacier Sea Food Co | 1 | Bering River * | ------ | ------ | ------ |
| Alaska Native Consolidated Canning Co. | 1 | Sand Point | ------ | ------ | ------ |
| Alaska Pacific Salmon Co | 1 | do | 3 | ------ | 3 |
| Alaska Packers Association | 2 | Chignik | 3 | ------ | 3 |
| | | Larsen Bay | 3 | ------ | 3 |
| Alaska Red Salmon Packers, Inc | 1 | Halibut Bay (Carmel) | ------ | ------ | ------ |
| Alaska Southern Packing Co | 1 | False Pass and Kupreanof Harbor (floating). | ------ | ------ | ------ |
| Alaska Year-Round Canneries Co | 1 | Seldovia | 4 | ------ | 4 |
| Chignik Packing Co | 1 | Chignik | ------ | ------ | ------ |
| Columbia River Packers Association, Inc. | 1 | Ikatan Bay (floating) | ------ | ------ | ------ |
| Cook Inlet Packing Co | 1 | Seldovia | 7 | ------ | 7 |
| Copper River Packing Co | 1 | McClure Bay | ------ | 5 | 5 |
| Crystal Falls Fish Co | 1 | Mountain Slough | ------ | ------ | ------ |
| Emard Packing Co | 1 | Anchorage | 3 | ------ | 3 |
| Far North Packing & Shipping Co., Inc. | 1 | Moser Bay (floating) | ------ | ------ | ------ |
| Fidalgo Island Packing Co | 1 | Port Graham | 6 | ------ | 6 |
| General Fish Co., Inc | 1 | Anchorage | 4 | ------ | 4 |
| W. R. Gilbert Co., Inc | 1 | Point Whitshed | ------ | ------ | ------ |
| Grimes Packing Co | 1 | Uzinki | ------ | ------ | ------ |
| Hagen & Co | 1 | Seward | ------ | ------ | ------ |
| P. E. Harris & Co | 1 | False Pass | 8 | ------ | 8 |
| Intercoastal Packing Co | 1 | Kupreanof Harbor (floating).* | ------ | ------ | ------ |
| International Packing Co | 1 | Ikatan, Unimak, Ivanof and Three Saints Bays (floating). | ------ | ------ | ------ |

*Companies that canned salmon in Alaska, number and location of canneries operated, and number of traps owned by each, 1939*—Continued

| Company | Canneries |  | Traps |  |  |
|---|---|---|---|---|---|
|  | Number | Location | Driven | Floating | Total |
| Central Alaska—Continued. |  |  |  |  |  |
| Kadiak Fisheries Co | 2 | Port Bailey | 5 |  | 5 |
|  |  | Shearwater Bay |  |  |  |
| Libby, McNeill & Libby | 1 | Kenai | 8 |  | 8 |
| Frank McConaghy Co., Inc | 1 | Kodiak (floating) |  |  |  |
| New England Fish Co | 1 | Cordova | 4 |  | 4 |
| North Pacific Sea Foods Co | 1 | Swanport |  |  |  |
| Pacific American Fisheries, Inc | 3 | Alitak | 6 |  | 6 |
|  |  | King Cove | 11 |  | 11 |
|  |  | Squaw Harbor | 4 |  | 4 |
| Pioneer Canneries, Inc | 1 | Cordova | 2 | 1 | 3 |
| Red Mountain Packers, Inc | 1 | Seldovia |  |  |  |
| Sandvik Hand Cannery | 1 | Uganik Village |  |  |  |
| San Juan Fishing & Packing Co | 2 | Port San Juan | 2 | 6 | 8 |
|  |  | Uganik Bay | 4 |  | 4 |
| Scotty's Packing Co | 1 | Mummy Island [1] |  |  |  |
| Shepard Point Packing Co | 1 | Port Ashton |  | 9 | 9 |
| Snug Harbor Packing Co | 1 | Snug Harbor | 7 |  | 7 |
| Uganik Fisheries, Inc | 1 | Uganik | 3 |  | 3 |
| Washington Fish & Oyster Co., Inc | 1 | Port William |  |  |  |
| Young and Trones | 1 | Eyak River (floating)* |  |  |  |
| Western Alaska: |  |  |  |  |  |
| Alaska Packers Association | 7 | Egegik River |  |  |  |
|  |  | Kvichak Bay (2) |  |  |  |
|  |  | Naknek River (2) |  |  |  |
|  |  | Nushagak |  |  |  |
|  |  | Ugashik |  |  |  |
| Alaska Salmon Co | 2 | Kvichak River |  |  |  |
|  |  | Wood River |  |  |  |
| Alaska Southern Packing Co., Inc | 1 | Port Moller (floating) |  |  |  |
| Columbia River Packers Association, Inc. | 3 | Naknek* |  |  |  |
|  |  | Nushagak |  |  |  |
|  |  | Port Moller (floating) |  |  |  |
| Intercoastal Packing Co | 1 | Naknek (floating)* |  |  |  |
| International Packing Co | 1 | Port Moller (floating) |  |  |  |
| Libby, McNeill & Libby | 4 | Egegik River |  |  |  |
|  |  | Ekuk |  |  |  |
|  |  | Koggiung |  |  |  |
|  |  | Libbyville |  |  |  |
| Nakat Packing Corporation, The | 1 | Nakeen |  |  |  |
| Pacific American Fisheries, Inc | 4 | Naknek River (2) |  |  |  |
|  |  | Nushagak |  |  |  |
|  |  | Port Moller |  |  |  |
| Red Salmon Canning Co | 2 | Naknek River |  |  |  |
|  |  | Ugashik River |  |  |  |

[1] Primarily a clam cannery.

NOTE.—A list of all traps operated in Alaska in 1939 appears on pages 125 to 130 of this report.

## LOSSES AND DISASTERS

Property losses reported by Alaska fishery operators amounted to $94,409 in 1939 and consisted chiefly of boats and fishing apparatus. Some loss of fish was included also, as well as a comparatively small amount of damage to buildings by storms.

The total property losses reported for southeast Alaska amounted to $55,258, of which the principal item was the tender *O. M. Arnold*, valued at $25,000, which sank a few miles north of Noyes Island during a gale. Three of the crew lost their lives in this disaster. For central Alaska the losses totaled $27,305; and for the western district, $11,846.

Twenty-one lives were lost during the year—8 in southeast, 7 in central, and 6 in western Alaska. In the southeastern district, 1 fisherman was drowned and 1 was killed in an accident, 2 shoresmen and 1 transporter died of disease, and 3 transporters were drowned.

Two fishermen and 1 transporter in central Alaska were drowned, 1 shoresman and 1 transporter died of disease, and 1 shoresman and 1 transporter met death by accident. In western Alaska 1 fisherman and 4 shoresmen died of disease and 1 fisherman was drowned.

## STATISTICS

One hundred and nine canneries were operated in Alaska in 1939, or 11 more than in the previous year. Employment was given to 24,921 persons, as compared with 22,280 in 1938, an increase of 2,641. White employees increased 1,254, natives 570, Chinese 31, Japanese 64, Filipinos 411, Mexicans 256, Kanakas 7, Negroes 35, and miscellaneous 22; while Puerto Ricans decreased 9.

The total pack of canned salmon was 5,263,153 cases, valued at $34,441,082. This is a decrease of about 23 percent in quantity and about 6 percent in value from the production in 1938, when the pack was 6,806,998 cases, valued at $36,636,897.

The output of canned salmon in southeast Alaska decreased from 2,713,948 cases in 1938 to 2,035,497 cases in 1939, or 25 percent; in central Alaska the decline was from 2,179,765 cases to 2,011,910 cases, or about 8 percent; and in western Alaska, from 1,913,285 cases to 1,215,746 cases, or 36 percent. By species, in Alaska as a whole, the pack of cohos decreased from 222,321 cases in 1938 to 104,122 cases in 1939, or 53 percent; chums, from 786,753 cases to 630,300 cases, or about 20 percent; pinks from 3,232,878 cases to 2,530,025 cases, or about 22 percent; kings from 43,813 cases to 32,458 cases, or about 26 percent; and reds from 2,521,233 cases to 1,966,248 cases, or 22 percent.

Details are included in the following tables to show comparison of the 1939 pack with the average for the 5 preceding years, 1934 to 1938, by cases of each species and by districts. Cohos declined 48 percent, chums 25 percent, pinks about 32 percent, kings 36 percent, and reds 7 percent from the 5-year average. By districts, the pack in 1939 decreased approximately 37 percent from the 5-year average in southeast Alaska, about 12 percent in the central district, and about 14 percent in western Alaska, making a net decrease of nearly 24 percent from the 5-year average for all of Alaska.

*Persons engaged, wages paid, and operating units of Alaska salmon canning industry, 1939*

| Item | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| PERSONS ENGAGED | | | | |
| Fishermen: | | | | |
| Whites | 1,383 | 1,472 | 2,429 | 5,284 |
| Natives | 1,263 | 791 | 378 | 2,432 |
| Japanese | | 2 | 1 | 3 |
| Filipinos | 9 | 1 | 2 | 12 |
| Mexicans | 2 | | | 2 |
| Kanakas | | 2 | | 2 |
| Negro | 1 | | | 1 |
| Total | 2,658 | 2,268 | 2,810 | 7,736 |
| Shoresmen: | | | | |
| Whites | 2,451 | 1,757 | 2,239 | 6,447 |
| Natives | 1,985 | 746 | 117 | 2,848 |
| Chinese | 61 | 105 | 237 | 403 |

*Persons engaged, wages paid, and operating units of Alaska salmon canning industry, 1939*—Continued

| Item | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| Shoresmen—Continued. | | | | |
| Japanese | 368 | 123 | 252 | 743 |
| Filipinos | 1,356 | 1,049 | 1,267 | 3,672 |
| Mexicans | 19 | 74 | 548 | 641 |
| Puerto Ricans | | 17 | 60 | 77 |
| Kanakas | 2 | 3 | 35 | 40 |
| Negroes | 6 | 26 | 82 | 114 |
| Miscellaneous [1] | | 21 | 42 | 63 |
| Total | 6,248 | 3,921 | 4,879 | 15,048 |
| Transporters: | | | | |
| Whites | 796 | 697 | 530 | 2,023 |
| Natives | 43 | 56 | 1 | 100 |
| Japanese | 2 | 1 | | 3 |
| Filipinos | | 3 | 1 | 4 |
| Puerto Rican | | | 1 | 1 |
| Kanaka | | 1 | | 1 |
| Negroes | | | 4 | 4 |
| Miscellaneous [1] | | | 1 | 1 |
| Total | 841 | 758 | 538 | 2,137 |
| Total: | | | | |
| Whites | 4,630 | 3,926 | 5,198 | 13,754 |
| Natives | 3,291 | 1,593 | 496 | 5,380 |
| Chinese | 61 | 105 | 237 | 403 |
| Japanese | 370 | 126 | 253 | 749 |
| Filipinos | 1,365 | 1,053 | 1,270 | 3,688 |
| Mexicans | 21 | 74 | 548 | 643 |
| Puerto Ricans | | 17 | 61 | 78 |
| Kanakas | 2 | 6 | 35 | 43 |
| Negroes | 7 | 26 | 86 | 119 |
| Miscellaneous | | 21 | 43 | 64 |
| Grand total | 9,747 | 6,947 | 8,227 | 24,921 |
| Wages paid shoresmen | $1,614,677 | $1,659,772 | $2,160,778 | $5,435,227 |
| Wages paid transporters | 428,075 | 417,693 | 345,866 | 1,191,634 |
| OPERATING UNITS | | | | |
| Plants: | | | | |
| Shore canneries | 44 | 36 | 22 | 102 |
| Floating canneries— | | | | |
| Power vessels | | 3 | 2 | 5 |
| Net tonnage | | 4,304 | 5,281 | 9,585 |
| Scows | | 2 | | 2 |
| Total plants operated | 44 | 41 | 24 | 109 |
| Vessels: | | | | |
| Power, over 5 tons | 488 | 199 | 94 | 781 |
| Net tonnage | 9,197 | 5,428 | 28,690 | 43,315 |
| Launches | 133 | 194 | 22 | 349 |
| Power dories | 10 | 117 | 12 | 139 |
| Gill-net boats, powered | 26 | 300 | | 326 |
| Gill-net boats, unpowered | 80 | 43 | 1,219 | 1,342 |
| Seine skiffs | 268 | 252 | 9 | 529 |
| Other rowboats and skiffs | 669 | 473 | 197 | 1,339 |
| Lighters and scows | 213 | 184 | 140 | 537 |
| Houseboats | 13 | 2 | 34 | 49 |
| Pile drivers | 24 | 31 | 16 | 71 |
| Pile pullers | 2 | 8 | | 10 |
| Rigging scows | 31 | 12 | | 43 |
| Apparatus: | | | | |
| Purse seines | 449 | 211 | 3 | 663 |
| Fathoms | 81,263 | 22,200 | 900 | 104,363 |
| Beach seines | 17 | 77 | | 94 |
| Fathoms | 1,205 | 8,228 | | 9,433 |
| Gill nets | 424 | 1,965 | 1,924 | 4,313 |
| Fathoms | 29,095 | 120,490 | 181,010 | 330,595 |
| Traps, driven | 23 | 126 | | 149 |
| Traps, floating | 262 | 32 | | 294 |

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[1] Koreans, Chileans, Peruvians, etc.

*Output and value of canned salmon in Alaska in 1939* [1]

| Product | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Cases | Value | Cases | Value | Cases | Value | Cases | Value |
| Coho, or silver: | | | | | | | | |
| ½-pound flat | 2, 718 | $27, 017 | 1, 125 | $8, 583 | | | 3, 843 | $35, 600 |
| 1-pound flat | 83 | 498 | 651 | 4, 742 | | | 734 | 5, 240 |
| 1-pound tall | 63, 435 | 429, 967 | 31, 879 | 209, 411 | | | 95, 314 | 639, 378 |
| 4-pound | | | 4, 231 | 24, 901 | | | 4, 231 | 24, 901 |
| Total | 66, 236 | 457, 482 | 37, 886 | 247, 637 | | | 104, 122 | 705, 119 |
| Chum, or keta: | | | | | | | | |
| ½-pound flat | 3, 041 | 18, 837 | 2, 525 | 15, 806 | | | 5, 566 | 34, 643 |
| 1-pound tall | 293, 063 | 1, 331, 421 | 236, 167 | 1, 054, 448 | 94, 750 | $425, 325 | 623, 980 | 2, 811, 194 |
| 4-pound | | | 754 | 2, 639 | | | 754 | 2, 639 |
| Total | 296, 104 | 1, 350, 258 | 239, 446 | 1, 072, 893 | 94, 750 | 425, 325 | 630, 300 | 2, 848, 476 |
| Pink, or humpback: | | | | | | | | |
| ½-pound flat | 47, 537 | 339, 097 | 1, 557 | 10, 839 | | | 49, 094 | 349, 936 |
| 1-pound tall | 1, 427, 821 | 7, 082, 025 | 1, 038, 633 | 5, 039, 667 | 2 | 10 | 2, 466, 456 | 12, 121, 702 |
| 4-pound | | | 14, 475 | 57, 908 | | | 14, 475 | 57, 908 |
| Total | 1, 475, 358 | 7, 421, 122 | 1, 054, 665 | 5, 108, 414 | 2 | 10 | 2, 530, 025 | 12, 529, 546 |
| King, or spring: | | | | | | | | |
| ½-pound flat | 10 | 100 | 6, 660 | 102, 521 | 10 | 122 | 6, 680 | 102, 743 |
| 1-pound flat | | | 775 | 9, 552 | 152 | 1, 368 | 927 | 10, 920 |
| 1-pound tall | 2, 431 | 19, 209 | 17, 079 | 127, 409 | 5, 341 | 40, 369 | 24, 851 | 186, 987 |
| Total | 2, 441 | 19, 309 | 24, 514 | 239, 482 | 5, 503 | 41, 859 | 32, 458 | 300, 650 |
| Red, or sockeye: | | | | | | | | |
| ½-pound flat | 64, 937 | 834, 140 | 84, 263 | 1, 092, 744 | 38, 368 | 502, 880 | 187, 568 | 2, 429, 764 |
| 1-pound flat | 2, 224 | 22, 240 | 41, 644 | 395, 817 | 590 | 5, 900 | 44, 458 | 423, 957 |
| 1-pound tall | 128, 197 | 1, 109, 736 | 520, 568 | 4, 506, 718 | 1, 076, 533 | 9, 513, 871 | 1, 725, 298 | 15, 130, 325 |
| 4-pound | | | 8, 924 | 73, 245 | | | 8, 924 | 73, 245 |
| Total | 195, 358 | 1, 966, 116 | 655, 399 | 6, 068, 524 | 1, 115, 491 | 10, 022, 651 | 1, 966, 248 | 18, 057, 291 |
| Grand total | 2, 035, 497 | 11, 214, 287 | 2, 011, 910 | 12, 736, 950 | 1. 215, 746 | 10. 489, 845 | 5, 263, 153 | 34. 441, 082 |

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[1] For the purpose of affording fair comparison, all cases are put upon the common basis of 48 1-pound cans per case.

*Output of canned salmon in Alaska, in cases, 1934 to 1939* [1]

BY SPECIES

| Product | 1934 | 1935 | 1936 | 1937 | 1938 | Average for 5-year period, 1934–38 | 1939 | Percentage increase or decrease in 1939, as compared with 5-year average |
|---|---|---|---|---|---|---|---|---|
| Coho, or silver: | | | | | | | | |
| ½-pound flat | 5, 785 | 6, 822 | 7, 309 | 9, 625 | 12, 022 | 8, 312 | 3, 843 | −53. 77 |
| 1-pound flat | 8, 283 | 2, 833 | 1, 335 | 1, 204 | 2, 845 | 3, 300 | 734 | −77. 76 |
| 1-pound tall | 222, 049 | 180, 522 | 213, 656 | 123, 610 | 202, 331 | 188, 434 | 95, 314 | −49. 42 |
| 4-pound | | | | 2, 878 | 5, 123 | 1, 600 | 4, 231 | +164. 44 |
| Total | 236, 117 | 190, 177 | 222, 300 | 137, 317 | 222, 321 | 201, 646 | 104, 122 | −48. 36 |
| Chum, or keta: | | | | | | | | |
| ½-pound flat | 2, 298 | 1, 647 | 1, 500 | 5, 883 | 5, 523 | 3, 370 | 5, 566 | +65. 16 |
| 1-pound flat | | | | 39 | | 8 | | −100. 00 |
| 1-pound tall | 738, 343 | 851, 281 | 1,099,583 | 723, 815 | 778, 966 | 838, 398 | 623, 980 | −25. 57 |
| 4-pound | | | | 1, 095 | 2, 264 | 672 | 754 | +12. 20 |
| Total | 740, 641 | 852, 928 | 1,101,083 | 730, 832 | 786, 753 | 842, 448 | 630, 300 | −25. 18 |

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[1] The number of cases has been put upon the common basis of 48 1-pound cans per case.

*Output of canned salmon in Alaska, in cases, 1934 to 1939*—Continued

BY SPECIES—Continued

| Product | 1934 | 1935 | 1936 | 1937 | 1938 | Average for 5-year period, 1934–38 | 1939 | Percentage increase or decrease in 1939, as compared with 5-year average |
|---|---|---|---|---|---|---|---|---|
| Pink, or humpback: | | | | | | | | |
| ½-pound flat | 28, 793 | 44, 560 | 37, 406 | 33, 338 | 50, 782 | 38, 976 | 49, 094 | +25. 96 |
| 1-pound flat | 1, 668 | 687 | ---------- | 438 | 4, 105 | 1, 380 | ---------- | −100. 00 |
| 1-pound tall | 3,793,732 | 3,198,819 | 4,522,388 | 3,586,905 | 3,163,493 | 3,653,067 | 2,466,456 | −32. 48 |
| 4-pound | ---------- | ---------- | ---------- | 4, 698 | 14, 498 | 3, 839 | 14, 475 | +277. 05 |
| Total | 3,824,193 | 3,244,066 | 4,559,794 | 3,625,379 | 3,232,878 | 3,697,262 | 2,530,025 | −31. 57 |
| King, or spring: | | | | | | | | |
| ½-pound flat | 9, 983 | 13, 462 | 10, 388 | 15, 495 | 2, 354 | 10, 337 | 6, 680 | −35. 38 |
| 1-pound flat | 10, 214 | 6, 520 | 5, 722 | 6, 213 | 6, 111 | 6, 956 | 927 | −86. 67 |
| 1-pound tall | 32, 666 | 16, 423 | 35, 774 | 47, 760 | 35, 348 | 33, 594 | 24, 851 | −26. 03 |
| Total | 52, 863 | 36, 405 | 51, 884 | 69, 468 | 43, 813 | 50, 887 | 32, 458 | −36. 22 |
| Red, or sockeye: | | | | | | | | |
| ½-pound flat | 88, 051 | 87, 498 | 137, 219 | 149, 424 | 122, 642 | 116, 967 | 187, 568 | +60. 36 |
| 1-pound flat | 73, 430 | 57, 693 | 118, 090 | 87, 654 | 51, 608 | 77, 695 | 44, 458 | −42. 78 |
| 1-pound tall | 2,466,535 | 664, 355 | 2,247,233 | 1,866,176 | 2,338,414 | 1,916,542 | 1,725,298 | −9. 98 |
| 4-pound | ---------- | ---------- | ---------- | 3, 415 | 8, 569 | 2, 397 | 8, 924 | +272. 30 |
| Total | 2,628,016 | 809, 546 | 2,502,542 | 2,106,669 | 2,521,233 | 2,113,601 | 1,966,248 | −6. 97 |
| Grand total | 7,481,830 | 5,133,122 | 8,437,603 | 6,669,665 | 6,806,998 | 6,905,844 | 5,263,153 | −23. 79 |
| BY DISTRICTS AND SPECIES | | | | | | | | |
| Southeast Alaska: | | | | | | | | |
| Coho, or silver | 158, 527 | 142, 493 | 134, 722 | 88, 525 | 143, 765 | 133, 606 | 66, 236 | −50. 42 |
| Chum, or keta | 394, 212 | 540, 948 | 778, 339 | 503, 766 | 474, 453 | 538, 343 | 296, 104 | −45. 00 |
| Pink, or humpback | 2, 622, 362 | 2, 200, 060 | 2, 925, 144 | 2, 143, 168 | 1, 886, 769 | 2, 355, 501 | 1, 475, 358 | −37. 37 |
| King, or spring | 15, 594 | 11, 108 | 20, 505 | 30, 693 | 16, 370 | 18, 854 | 2, 441 | −87. 05 |
| Red, or sockeye | 104, 398 | 159, 429 | 218, 007 | 167, 744 | 192, 591 | 168, 434 | 195, 358 | +15. 98 |
| Total | 3, 295, 093 | 3, 054, 038 | 4, 076, 717 | 2, 933, 896 | 2, 713, 948 | 3, 214, 738 | 2, 035, 497 | −36. 68 |
| Central Alaska: | | | | | | | | |
| Coho, or silver | 76, 371 | 47, 461 | 86, 007 | 48, 654 | 78, 211 | 67, 341 | 37, 886 | −43. 74 |
| Chum, or keta | 313, 233 | 302, 123 | 296, 188 | 191, 610 | 252, 686 | 271, 168 | 239, 446 | −11. 70 |
| Pink, or humpback | 1, 199, 872 | 1, 044, 002 | 1, 603, 584 | 1, 482, 210 | 1, 346, 109 | 1, 335, 155 | 1, 054, 665 | −21. 01 |
| King, or spring | 28, 472 | 24, 462 | 27, 073 | 31, 644 | 20, 944 | 26, 519 | 24, 514 | −7. 56 |
| Red, or sockeye | 709, 470 | 384, 183 | 856, 829 | 462, 241 | 481, 815 | 578, 908 | 655, 399 | +13. 21 |
| Total | 2, 327, 418 | 1, 802, 231 | 2, 869, 681 | 2, 216, 359 | 2, 179, 765 | 2, 279, 091 | 2, 011, 910 | −11. 72 |
| Western Alaska: | | | | | | | | |
| Coho, or silver | 1, 219 | 223 | 1, 571 | 138 | 345 | 699 | ---------- | −100. 00 |
| Chum, or keta | 33, 196 | 9, 857 | 26, 556 | 35, 456 | 59, 614 | 32, 936 | 94, 750 | +187. 68 |
| Pink.or humpback | 1, 959 | 4 | 31, 066 | 1 | ---------- | 6, 606 | 2 | −99. 97 |
| King, or spring | 8, 797 | 835 | 4, 306 | 7, 131 | 6, 499 | 5, 514 | 5, 503 | −. 20 |
| Red, or sockeye | 1, 814, 148 | 265, 934 | 1, 427, 706 | 1, 476, 684 | 1, 846, 827 | 1, 366, 260 | 1, 115, 491 | −18. 35 |
| Total | 1, 859, 319 | 276, 853 | 1, 491, 205 | 1, 519, 410 | 1, 913, 285 | 1, 412, 015 | 1, 215, 746 | −13. 90 |
| Grand total | 7, 481, 830 | 5, 133, 122 | 8, 437, 603 | 6, 669, 665 | 6, 806, 998 | 6, 905, 844 | 5, 263, 153 | −23. 79 |

*Relative importance of each species of canned salmon within each district in 1939*

| District | Coho | Chum | Pink | King | Red | Total, all species |
|---|---|---|---|---|---|---|
| | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* |
| Southeast Alaska | 3. 3 | 14. 5 | 72. 5 | 0. 1 | 9. 6 | 100. 0 |
| Central Alaska | 1. 9 | 11. 9 | 52. 4 | 1. 2 | 32. 6 | 100. 0 |
| Western Alaska | . 0 | 7. 8 | . 0 | . 4 | 91. 8 | 100. 0 |
| All Alaska | 2. 0 | 12. 0 | 48. 1 | . 6 | 37. 3 | 100. 0 |

*Relative importance of each district in the production of each species of salmon canned in 1939*

| District | Coho | Chum | Pink | King | Red | Total, all species |
|---|---|---|---|---|---|---|
| | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* |
| Southeast Alaska | 63.6 | 47.0 | 58.3 | 7.5 | 9.9 | 38.7 |
| Central Alaska | 36.4 | 38.0 | 41.7 | 75.5 | 33.3 | 38.2 |
| Western Alaska | .0 | 15.0 | .0 | 17.0 | 56.7 | 23.1 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

*Average annual price per case of 48 1-pound cans of salmon, 1929 to 1939*

| Product | 1929 | 1930 | 1931 | 1932 | 1933 | 1934 | 1935 | 1936 | 1937 | 1938 | 1939 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Coho, or silver | $7.59 | $8.26 | $6.51 | $4.12 | $5.20 | $5.23 | $6.40 | $6.51 | $8.14 | $6.29 | $6.77 |
| Chum, or keta | 5.35 | 3.60 | 3.19 | 2.79 | 4.12 | 3.65 | 3.83 | 3.58 | 4.62. | 3.61 | 4.52 |
| Pink, or humpback | 6.06 | 4.17 | 3.46 | 3.14 | 4.52 | 4.10 | 4.14 | 3.94 | 4.95 | 3.86 | 4.95 |
| King, or spring | 11.92 | 13.32 | 9.40 | 5.46 | 7.51 | 6.85 | 8.70 | 7.95 | 9.94 | 7.50 | 9.26 |
| Red, or sockeye | 10.71 | 12.57 | 9.20 | 5.61 | 6.71 | 6.72 | 9.32 | 8.38 | 10.12 | 7.77 | 9.18 |

## PACK IN CERTAIN DISTRICTS

Statistics of the salmon pack are again presented for subdivisions of the three main districts of Alaska, and comparison is made with statistics for 1938. Where the pack at a given cannery is made up of fish from more than one district, as in the case of that at certain Cordova canneries packing fish caught both in Prince William Sound and in the Copper River area or at several plants in the Kodiak area which at times obtain a limited supply of fish from the Chignik or Cook Inlet runs, due segregation has been made in order to credit each district with the pack from salmon caught therein.

Insofar as the southeastern Alaska area is concerned, a change is being made to eliminate certain subdivisions. Except in the Yakutat region, the packs for the several districts did not represent the output of any clearly defined or independent runs, and it would seem that the use made of the data does not warrant a continuation of the work involved in their preparation, in view of the increasing practice of transferring fish from one district to another for canning. The pack figures for southeast Alaska, therefore, are shown for only 2 subdivisions, instead of 5 as heretofore.

The various districts are described as follows:

### WESTERN ALASKA

*Bristol Bay.*—The Bering Sea shore, east and north of the Ugashik River.

*Port Moller and Herendeen Bay.*—Port Moller, Herendeen Bay, and Nelson Lagoon.

### CENTRAL ALASKA

*Ikatan-Shumagin Islands.*—False Pass, Ikatan Bay, King Cove, and the Shumagin Islands.

*Chignik.*—Mainland shore from Castle Cape to Cape Kunmik.

*Kodiak-Afognak Islands.*—Kodiak, Spruce, and Raspberry Islands.

*Cook Inlet.*—The shores of Cook Inlet.

*Prince William Sound.*—Resurrection Bay to Point Whitshed.

*Copper and Bering Rivers.*—Point Whitshed to Bering River.

### SOUTHEASTERN ALASKA

*Yakutat and Dry Bay.*—Yakutat Bay to and including Dry Bay.

*Cape Fairweather-Dixon Entrance.*—All waters of southeastern Alaska south of Cape Fairweather.

*Pack of canned salmon in Alaska in 1939, by districts* [1]

| District | Coho | Chum | Pink | King | Red | Total | Percentage increase or decrease from 1938 |
|---|---|---|---|---|---|---|---|
| | *Cases* | *Cases* | *Cases* | *Cases* | *Cases* | *Cases* | |
| Bristol Bay | | 88,272 | | 5,038 | 1,059,181 | 1,152,491 | −37.13 |
| Port Moller and Herendeen Bay | | 6,478 | 2 | 465 | 56,310 | 63,255 | −20.99 |
| Ikatan-Shumagin Islands | 9,835 | 120,901 | 292,203 | 4,483 | 149,046 | 576,468 | −.12 |
| Chignik | 728 | 6,874 | 13,744 | 377 | 142,770 | 164,493 | +191.59 |
| Kodiak-Afognak Islands | 9,442 | 62,185 | 603,492 | 651 | 115,604 | 791,374 | +16.89 |
| Cook Inlet | 13,076 | 20,726 | 15,570 | 16,554 | 183,304 | 249,230 | −14.26 |
| Prince William Sound | 3,858 | 28,756 | 129,491 | 257 | 12,390 | 174,752 | −65.74 |
| Copper and Bering Rivers | 947 | 4 | 165 | 2,192 | 52,285 | 55,593 | −18.78 |
| Yakutat and Dry Bay | 9,301 | 47 | 2,237 | 1,629 | 25,463 | 38,677 | −38.93 |
| Cape Fairweather-Dixon Entrance | 56,935 | 296,057 | 1,473,121 | 812 | 169,895 | 1,996,820 | −24.67 |
| Total | 104,122 | 630,300 | 2,530,025 | 32,458 | 1,966,248 | 5,263,153 | −22.68 |

[1] Pack reduced to the basis of 48 1-pound cans per case.

*Canneries operated in Alaska in 1939, by districts*

| District | Canneries located in district | Canneries handling salmon taken in district | District | Canneries located in district | Canneries handling salmon taken in district |
|---|---|---|---|---|---|
| | *Number* | *Number* | | *Number* | *Number* |
| Bristol Bay | [1] 22 | 22 | Prince William Sound | 9 | 7 |
| Port Moller and Herendeen Bay | [2] 4 | 4 | Copper and Bering Rivers | 3 | 7 |
| Ikatan-Shumagin Islands | [3] 9 | 9 | Yakutat and Dry Bay | 1 | 1 |
| Chignik | 2 | 5 | Cape Fairweather-Dixon Entrance | 43 | 43 |
| Kodiak-Afognak Islands | [1] 13 | 13 | | | |
| Cook Inlet | 8 | 9 | Total (without duplication) | 109 | |

[1] Includes 1 floating plant that was operated in more than 1 district.
[2] Includes 3 floating plants that were operated in more than 1 district.
[3] Includes 4 floating plants that were operated in more than 1 district.

### EMPLOYMENT AND WAGES

In cooperation with the Alaska Planning Council certain detailed statistics were collected for the first time with regard to labor employed and wages paid by the salmon-canning industry in Alaska in 1939. These statistics have to do with the labor and wages by racial distribution; the number of residents and nonresidents, whether citizens or aliens, and the wages paid these groups in and outside Alaska; and the number of salmon packed that were caught by residents and non-residents by the various types of gear. The data thus collected are summarized in the following tables:

*Labor and wages, by racial distribution, Alaska salmon canning industry, 1939*

| Item | Southeast Alaska | | | | Central Alaska | | | |
|---|---|---|---|---|---|---|---|---|
| | Fishermen | Shoresmen | Transporters | Total | Fishermen | Shoresmen | Transporters | Total |
| Whites | 835 | 2,046 | 702 | 3,583 | 1,282 | 1,432 | 622 | 3,336 |
| Wages paid: | | | | | | | | |
| In Alaska | $188,176 | $534,206 | $237,065 | $959,447 | $578,598 | $471,503 | $182,193 | $1,232,294 |
| Outside Alaska | $95,436 | $290,435 | $146,524 | $532,395 | $243,753 | $429,241 | $191,859 | $864,853 |
| Natives | 1,026 | 1,804 | 31 | 2,861 | 687 | 680 | 52 | 1,419 |
| Wages paid: | | | | | | | | |
| In Alaska | $289,919 | $215,107 | $9,719 | $514,745 | $343,240 | $147,364 | $27,286 | $517,890 |
| Outside Alaska | -------- | $217 | -------- | $217 | -------- | $503 | $1,352 | $1,855 |
| Other nationalities | 12 | 1,681 | 2 | 1,695 | -------- | 1,331 | 5 | 1,336 |
| Wages paid: | | | | | | | | |
| In Alaska | $2,188 | $235,153 | $574 | $237,915 | -------- | $202,429 | -------- | $202,429 |
| Outside Alaska | -------- | $168,237 | -------- | $168,237 | -------- | $316,463 | $2,104 | $318,567 |
| Employees for whom segregation of wages could not be furnished: [1] | | | | | | | | |
| Whites | 548 | 405 | 94 | 1,047 | 190 | 325 | 75 | 590 |
| Natives | 237 | 181 | 12 | 430 | 104 | 66 | 4 | 174 |
| Other nationalities | -------- | 131 | -------- | 131 | 5 | 87 | -------- | 92 |
| Wages paid: | | | | | | | | |
| In Alaska | $64,786 | $142,339 | -------- | $207,125 | $117,288 | $37,602 | $630 | $155,520 |
| Outside Alaska | -------- | -------- | -------- | -------- | -------- | $1,780 | $7,544 | $9,324 |
| Unallocated [2] | -------- | $28,983 | $34,193 | $63,176 | $29,983 | $52,887 | $4,725 | $87,595 |
| Summary: | | | | | | | | |
| Persons engaged: | | | | | | | | |
| Whites | 1,383 | 2,451 | 796 | 4,630 | 1,472 | 1,757 | 697 | 3,926 |
| Natives | 1,263 | 1,985 | 43 | 3,291 | 791 | 746 | 56 | 1,593 |
| Other nationalities | 12 | 1,812 | 2 | 1,826 | 5 | 1,418 | 5 | 1,428 |
| Total | 2,658 | 6,248 | 841 | 9,747 | 2,268 | 3,921 | 758 | 6,947 |
| Wages paid: | | | | | | | | |
| In Alaska | $545,069 | $1,126,805 | $247,358 | $1,919,232 | $1,039,126 | $858,898 | $210,109 | $2,108,133 |
| Outside Alaska | 95,436 | 458,889 | 146,524 | 700,849 | 243,753 | 747,987 | 202,859 | 1,194,599 |
| Unallocated [2] | -------- | 28,983 | 34,193 | 63,176 | 29,983 | 52,887 | 4,725 | 87,595 |
| Total [2] | 640,505 | 1,614,677 | 428,075 | 2,683,257 | 1,312,862 | 1,659,772 | 417,693 | 3,390,327 |

| Item | Western Alaska | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|
| | Fishermen | Shoresmen | Transporters | Total | Fishermen | Shoresmen | Transporters | Total |
| Whites | 2,335 | 2,198 | 530 | 5,063 | 4,452 | 5,676 | 1,854 | 11,982 |
| Wages paid: | | | | | | | | |
| In Alaska | $908,920 | $252,393 | $68,135 | $1,229,448 | $1,675,694 | $1,258,102 | $487,393 | $3,421,189 |
| Outside Alaska | $1,290,883 | $987,772 | $272,218 | $2,550,873 | $1,630,072 | $1,707,448 | $610,601 | $3,948,121 |
| Natives | 378 | 117 | 1 | 496 | 2,091 | 2,601 | 84 | 4,776 |
| Wages paid: | | | | | | | | |
| In Alaska | $303,784 | $43,835 | $267 | $347,886 | $936,943 | $406,306 | $37,272 | $1,380,521 |
| Outside Alaska | -------- | -------- | -------- | -------- | -------- | $720 | $1,352 | $2,072 |
| Other nationalities | 3 | 2,523 | 7 | 2,533 | 15 | 5,535 | 14 | 5,564 |
| Wages paid: | | | | | | | | |
| In Alaska | $2,537 | $144,815 | -------- | $147,352 | $4,725 | $582,397 | $574 | $587,696 |
| Outside Alaska | -------- | $685,312 | $5,246 | $690,558 | -------- | $1,170,012 | $7,350 | $1,177,362 |
| Employees for whom segregation of wages could not be furnished: [1] | | | | | | | | |
| Whites | 94 | 41 | -------- | 135 | 832 | 771 | 169 | 1,772 |
| Natives | -------- | -------- | -------- | -------- | 341 | 247 | 16 | 604 |
| Other nationalities | -------- | -------- | -------- | -------- | 5 | 218 | -------- | 223 |
| Wages paid: | | | | | | | | |
| In Alaska | -------- | -------- | -------- | -------- | $182,074 | $179,941 | $630 | $362,645 |
| Outside Alaska | -------- | $45,711 | -------- | $45,711 | -------- | $47,491 | $7,544 | $55,035 |
| Unallocated [2] | -------- | $940 | -------- | $940 | $29,983 | $82,810 | $38,918 | $151,711 |

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[1] Includes independent fishermen credited to the salmon canning industry.

[2] Incomplete, inasmuch as information is not available regarding amounts paid independent fishermen.

*Labor and wages, by racial distribution, Alaska salmon canning industry, 1939*—Con.

| Item | Western Alaska | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|
| | Fishermen | Shoresmen | Transporters | Total | Fishermen | Shoresmen | Transporters | Total |
| Summary: | | | | | | | | |
| Persons engaged: | | | | | | | | |
| Whites | 2, 429 | 2, 239 | 530 | 5, 198 | 5, 284 | 6, 447 | 2, 023 | 13, 754 |
| Natives | 378 | 117 | 1 | 496 | 2, 432 | 2, 848 | 100 | 5, 380 |
| Other nationalities | 3 | 2, 523 | 7 | 2, 533 | 20 | 5, 753 | 14 | 5, 787 |
| Total | 2, 810 | 4, 879 | 538 | 8, 227 | 7, 736 | 15, 048 | 2, 137 | 24, 921 |
| Wages paid: | | | | | | | | |
| In Alaska | $1, 215, 241 | $441, 043 | $68, 402 | $1, 724, 686 | $2, 799, 436 | $2, 426, 746 | $525, 869 | $5, 752, 051 |
| Outside Alaska | 1, 290, 883 | 1, 718, 795 | 277, 464 | 3, 287, 142 | 1, 630, 072 | 2, 925, 671 | 626, 847 | 5, 182, 590 |
| Unallocated [2] | ---------- | 940 | -------- | 940 | 29, 983 | 82, 810 | 38, 918 | 151, 711 |
| Total [2] | 2, 506, 124 | 2, 160, 778 | 345, 866 | 5, 012, 768 | 4, 459, 491 | 5, 435, 227 | 1, 191, 634 | 11, 086, 352 |

*Labor and wages of residents and nonresidents, Alaska salmon canning industry, 1939*

| Item | Southeast Alaska | | | | Central Alaska | | | |
|---|---|---|---|---|---|---|---|---|
| | Fishermen | Shoresmen | Transporters | Total | Fishermen | Shoresmen | Transporters | Total |
| Residents: | | | | | | | | |
| Citizens | 1, 525 | 3, 725 | 311 | 5, 561 | 1, 529 | 1, 451 | 152 | 3, 132 |
| Wages paid: | | | | | | | | |
| In Alaska | $439, 119 | $603, 939 | $112, 118 | $1, 155, 176 | $822, 936 | $319, 744 | $68, 751 | $1, 211, 431 |
| Outside Alaska | $991 | $7, 789 | $11, 502 | $20, 282 | ---------- | $3, 989 | $839 | $4, 828 |
| Aliens | 9 | 131 | 2 | 142 | 3 | 59 | 2 | 64 |
| Wages paid: | | | | | | | | |
| In Alaska | $2, 835 | $29, 279 | $574 | $32, 688 | $793 | $26, 670 | $1, 469 | $28, 932 |
| Outside Alaska | --------- | $1, 164 | -------- | $1, 164 | ---------- | ---------- | -------- | ---------- |
| Nonresidents: | | | | | | | | |
| Citizens | 488 | 1, 044 | 415 | 1, 947 | 569 | 1, 294 | 352 | 2, 215 |
| Wages paid: | | | | | | | | |
| In Alaska | $99, 639 | $323, 034 | $132, 530 | $555, 203 | $208, 924 | $364, 509 | $129, 853 | $703, 286 |
| Outside Alaska | $90, 476 | $304, 382 | $132, 754 | $527, 612 | $241, 438 | $372, 259 | $138, 457 | $752, 154 |
| Aliens | 14 | 1, 082 | 7 | 1, 103 | 9 | 418 | 5 | 432 |
| Wages paid: | | | | | | | | |
| In Alaska | $3, 476 | $156, 359 | $2, 136 | $161, 971 | $6, 473 | $100, 205 | $3, 432 | $110, 110 |
| Outside Alaska | $3, 969 | $145, 554 | $2, 268 | $151, 791 | $2, 315 | $50, 964 | -------- | $53, 279 |
| Additional items for which complete segregation could not be furnished: | | | | | | | | |
| Residents | --------- | 71 | -------- | 71 | ---------- | 95 | 8 | 103 |
| Wages paid, in Alaska | --------- | $14, 194 | -------- | $14, 194 | ---------- | $47, 770 | $6, 604 | $54, 374 |
| Nonresidents | --------- | ---------- | -------- | ---------- | ---------- | 392 | 186 | 578 |
| Wages paid, outside Alaska | --------- | ---------- | -------- | ---------- | ---------- | $320, 775 | $63, 563 | $384, 338 |
| Unallocated: | | | | | | | | |
| Persons engaged [1] | 622 | 195 | 106 | 923 | 158 | 212 | 53 | 423 |
| Wages paid [2] | --------- | $28, 983 | $34, 193 | $63, 176 | $29, 983 | $52, 887 | $4, 725 | $87, 595 |
| Summary: | | | | | | | | |
| Persons engaged: | | | | | | | | |
| Residents | 1, 534 | 3, 927 | 313 | 5, 774 | 1, 532 | 1, 605 | 162 | 3, 299 |
| Nonresidents | 502 | 2, 126 | 422 | 3, 050 | 578 | 2, 104 | 543 | 3, 225 |
| Unallocated | 622 | 195 | 106 | 923 | 158 | 212 | 53 | 423 |
| Total | 2, 658 | 6, 248 | 841 | 9, 747 | 2, 268 | 3, 921 | 758 | 6, 947 |
| Wages paid: | | | | | | | | |
| In Alaska | $545, 069 | $1, 126, 805 | $247, 358 | $1, 919, 232 | $1, 039, 126 | $858, 898 | $210, 109 | $2, 108, 133 |
| Outside Alaska | 95, 436 | 458, 889 | 146, 524 | 700, 849 | 243, 753 | 747, 987 | 202, 859 | 1, 194, 599 |
| Unallocated [2] | --------- | 28, 983 | 34, 193 | 63, 176 | 29, 983 | 52, 887 | 4, 725 | 87, 595 |
| Total [2] | 640, 505 | 1, 614, 677 | 428, 075 | 2, 683, 257 | 1, 312, 862 | 1, 659, 772 | 417, 693 | 3, 390, 327 |

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[1] Includes independent fishermen credited to the salmon canning industry.

[2] Incomplete, inasmuch as information is not available regarding amounts paid independent fishermen.

*Labor and wages of residents and nonresidents, Alaska salmon canning industry, 1939*—Continued

| Item | Western Alaska | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|
| | Fishermen | Shoresmen | Transporters | Total | Fishermen | Shoresmen | Transporters | Total |
| Residents: | | | | | | | | |
| Citizens | 1,262 | 431 | 32 | 1,725 | 4,316 | 5,607 | 495 | 10,418 |
| Wages paid: | | | | | | | | |
| In Alaska | $962,305 | $140,466 | $14,609 | $1,117,380 | $2,224,360 | $1,064,149 | $195,478 | $3,483,987 |
| Outside Alaska | ---------- | ---------- | -------- | ---------- | $991 | $11,778 | $12,341 | $25,110 |
| Aliens | 23 | 19 | 1 | 43 | 35 | 209 | 5 | 249 |
| Wages paid: | | | | | | | | |
| In Alaska | $21,156 | $8,816 | $182 | $30,154 | $24,784 | $64,765 | $2,225 | $91,774 |
| Outside Alaska | ---------- | ---------- | -------- | ---------- | ---------- | $1,164 | -------- | $1,164 |
| Nonresidents: | | | | | | | | |
| Citizens | 1,335 | 1,413 | 349 | 3,097 | 2,392 | 3,751 | 1,116 | 7,259 |
| Wages paid: | | | | | | | | |
| In Alaska | $228,106 | $133,665 | $52,995 | $414,766 | $536,669 | $821,208 | $315,378 | $1,673,255 |
| Outside Alaska | $1,199,271 | $609,612 | $181,658 | $1,990,541 | $1,531,185 | $1,286,253 | $452,869 | $3,270,307 |
| Aliens | 96 | 1,302 | 8 | 1,406 | 119 | 2,802 | 20 | 2,941 |
| Wages paid: | | | | | | | | |
| In Alaska | $3,674 | $100,522 | -------- | $104,196 | $13,623 | $357,086 | $5,568 | $376,277 |
| Outside Alaska | $91,612 | $292,713 | $4,915 | $389,240 | $97,896 | $489,231 | $7,183 | $594,310 |
| Additional items for which complete segregation could not be furnished: | | | | | | | | |
| Residents | ---------- | 114 | 1 | 115 | ---------- | 280 | 9 | 289 |
| Wages paid, in Alaska | ---------- | $57,574 | $616 | $58,190 | ---------- | $119,538 | $7,220 | $126,758 |
| Nonresidents | ---------- | 1,559 | 147 | 1,706 | ---------- | 1,951 | 333 | 2,284 |
| Wages paid, outside Alaska | ---------- | $816,470 | $90,891 | $907,361 | ---------- | $1,137,245 | $154,454 | $1,291,699 |
| Unallocated: | | | | | | | | |
| Persons engaged [1] | 94 | 41 | -------- | 135 | 874 | 448 | 159 | 1,481 |
| Wages paid [2] | ---------- | $940 | -------- | $940 | $29,983 | $82,810 | $38,918 | $151,711 |
| Summary: | | | | | | | | |
| Persons engaged: | | | | | | | | |
| Residents | 1,285 | 564 | 34 | 1,883 | 4,351 | 6,096 | 509 | 10,956 |
| Nonresidents | 1,431 | 4,274 | 504 | 6,209 | 2,511 | 8,504 | 1,469 | 12,484 |
| Unallocated | 94 | 41 | -------- | 135 | 874 | 448 | 159 | 1,481 |
| Total | 2,810 | 4,879 | 538 | 8,227 | 7,736 | 15,048 | 2,137 | 24,921 |
| Wages paid: | | | | | | | | |
| In Alaska | $1,215,241 | $441,043 | $68,402 | $1,724,686 | $2,799,436 | $2,426,746 | $525,869 | $5,752,051 |
| Outside Alaska | 1,290,883 | 1,718,795 | 277,464 | 3,287,142 | 1,630,072 | 2,925,671 | 626,847 | 5,182,590 |
| Unallocated [2] | ---------- | 940 | -------- | 940 | 29,983 | 82,810 | 38,918 | 151,711 |
| Total [2] | 2,506,124 | 2,160,778 | 345,866 | 5,012,768 | 4,459,491 | 5,435,227 | 1,191,634 | 11,086,352 |

[1] Includes independent fishermen credited to the salmon canning industry.

[2] Incomplete, inasmuch as information is not available regarding amounts paid independent fishermen.

*Source of supply of salmon packed by Alaska canneries in 1939*

| Apparatus | Catch, by districts and by resident and nonresident fishermen | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
| | Residents | Nonresidents | Residents | Nonresidents | Residents | Nonresidents | Residents | Nonresidents |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Seines | 8,441,732 | 750,660 | 9,146,622 | 3,790,614 | ---------- | 691,339 | 17,588,354 | 5,232,613 |
| Gill nets | 760,572 | 24,964 | 2,265,357 | 768,401 | 4,009,069 | 10,487,004 | 7,034,998 | 11,280,369 |
| Traps | 5,338,597 | 14,146,072 | 1,543,073 | 14,380,609 | ---------- | ---------- | 6,881,670 | 28,526,681 |
| Lines | 114,820 | ---------- | ---------- | ---------- | ---------- | ---------- | 114,820 | ---------- |
| Total | 14,655,721 | 14,921,696 | 12,955,052 | 18,939,624 | 4,009,069 | 11,178,343 | 31,619,842 | 45,039,663 |

## MILD CURING

The output of mild-cured coho salmon in 1939 showed a sharp decline from that of the previous year, but there was a slight gain in the production of kings, with the result that the season's total mild-cured product was above the average, although somewhat short of that for 1938. One hundred and sixty-six tierces of kings were prepared at or near the mouth of the Yukon River for the outside market, and the remainder came from southeast Alaska.

Sixteen plants were in operation, as compared with 21 in the preceding year, and several additional concerns again prepared mild-cured salmon in connection with canning and other operations. The number of persons employed increased from 1,753 in 1938 to 1,849 in 1939. It is thought that the difference may be accounted for largely by the more thorough collection of statistical data, owing to the new general regulation which requires that the name and number of each trolling boat be furnished in writing each season to the local representative of the Bureau, prior to the commencement of commercial fishing.

The total output of mild-cured salmon was 5,909,600 pounds, valued at $1,101,176, a decrease of 609,600 pounds in quantity and $177,755 in value from the production in 1938.

*Persons engaged, wages paid, and operating units, Alaska salmon mild-curing industry, 1939*

| Item | Southeast Alaska | Western Alaska | Total |
|---|---|---|---|
| PERSONS ENGAGED | | | |
| Fishermen: | | | |
| Whites | 1,301 | 1 | 1,302 |
| Natives | 148 | 20 | 168 |
| Filipinos | 3 | | 3 |
| Total | 1,452 | 21 | 1,473 |
| Shoresmen: | | | |
| Whites | 307 | | 307 |
| Natives | 24 | 31 | 55 |
| Total | 331 | 31 | 362 |
| Transporters: | | | |
| Whites | 12 | | 12 |
| Natives | | 2 | 2 |
| Total | 12 | 2 | 14 |
| Grand total | 1,795 | 54 | 1,849 |
| Wages paid shoresmen | $171,823 | $3,159 | $174,982 |
| Wages paid transporters | $8,273 | $300 | $8,573 |
| OPERATING UNITS | | | |
| Plants: | | | |
| Shore | 11 | 2 | 13 |
| Floating: | | | |
| Barges | 2 | | 2 |
| Net tonnage | 300 | | 300 |
| Scow | | 1 | 1 |
| Total plants operated | 13 | 3 | 16 |
| Vessels: | | | |
| Power, over 5 tons | 369 | 3 | 372 |
| Net tonnage | 3,013 | 43 | 3,056 |
| Launches | 563 | 1 | 564 |
| Power dory | | 1 | 1 |
| Gill-net boats | | 9 | 9 |
| Rowboats and skiffs | 99 | | 99 |
| Apparatus: | | | |
| Gill nets | | 22 | 22 |
| Fathoms | | 534 | 534 |
| Lines | 3,687 | | 3,687 |
| Wheels | | 4 | 4 |

*Products of Alaska salmon mild-curing industry in 1939*

| Products | Southeast Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Coho, or silver | [1] 119,200 | $17,163 | | | 119,200 | $17,163 |
| King, or spring | [2] 5,657,600 | 1,067,013 | [3] 132,800 | $17,000 | [4] 5,790,400 | 1,084,013 |
| Total | 5,776,800 | 1,084,176 | 132,800 | 17,000 | 5,909,600 | 1,101,176 |

[1] 149 tierces. [2] 7,072 tierces. [3] 166 tierces. [4] 7,238 tierces.

## Pickling

A very light production of pickled salmon was reported for the 1939 season in Alaska, the amount being the smallest for any year since 1932. Nearly 76 percent of the season's output was prepared in central Alaska, chiefly in the Ikatan-Shumagin region, 17 percent came from western Alaska, and 7 percent from the southeastern district. The bulk of the pack consisted of reds and cohos.

There were 36 persons employed, or 181 less than the number reported for 1938. The total output was 322,400 pounds, valued at $34,121, as compared with 1,177,685 pounds valued at $122,421 in the previous year.

*Persons engaged, wages paid, and operating units, Alaska salmon-pickling industry, 1939*

| Item | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| PERSONS ENGAGED | | | | |
| Fishermen: | | | | |
| Whites | 3 | 20 | 5 | 28 |
| Natives | 2 | 3 | | 5 |
| Total | 5 | 23 | 5 | 33 |
| Shoresmen: Whites | | 3 | | 3 |
| Grand total | 5 | 26 | 5 | 36 |
| Wages paid shoresmen | | $528 | | $528 |
| OPERATING UNITS | | | | |
| Plants: Shore | 2 | 13 | 4 | 19 |
| Vessels: | | | | |
| Power, over 5 tons | | 4 | | 4 |
| Net tonnage | | 40 | | 40 |
| Launches | 5 | 7 | | 12 |
| Power dories | | 9 | | 9 |
| Gill-net boats | 2 | 2 | | 4 |
| Seine skiffs | 1 | 14 | | 15 |
| Other rowboats and skiffs | | 8 | 2 | 10 |
| Scow | | 1 | | 1 |
| Apparatus: | | | | |
| Purse seine | | 1 | | 1 |
| Fathoms | | 100 | | 100 |
| Beach seines | | 14 | | 14 |
| Fathoms | | 998 | | 998 |
| Gill nets | 10 | 17 | 7 | 34 |
| Fathoms | 460 | 913 | 185 | 1,558 |

*Products of Alaska salmon-pickling industry in 1939*

| Products | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Coho, or silver | 17,300 | $1,213 | 86,500 | $6,949 | 3,100 | $327 | 106,900 | $8,489 |
| Chum, or keta | 2,800 | 196 | | | | | 2,800 | 196 |
| King, or spring | | | 1,600 | 235 | 8,900 | 774 | 10,500 | 1,009 |
| Red, or sockeye | 2,900 | 360 | 155,300 | 19,139 | 44,000 | 4,928 | 202,200 | 24,427 |
| Total | 23,000 | 1,769 | 243,400 | 26,323 | 56,000 | 6,029 | 322,400 | 34,121 |

## FRESH SALMON

Operations in the fresh-salmon business were on about the same scale as in the previous year and were carried on chiefly in connection with other branches of the fisheries. Except for a small output incidental to trout operations at Seward, in the central district, the entire production was from southeast Alaska. Four dealers whose principal output was fresh salmon gave employment to 14 white shoresmen and 5 transporters.

The total products amounted to 3,912,918 pounds, valued at $284,133, as compared with 3,817,042 pounds valued at $291,335 in 1938—an increase of about 3 percent in quantity, but a decrease of 2 percent in value.

The foregoing figures do not include fresh salmon sold to halibut boats for bait, but they do include fish exported to canneries in British Columbia.

*Products of Alaska fresh-salmon industry in 1939*

| Species | Pounds | Value | Species | Pounds | Value |
|---|---|---|---|---|---|
| Coho, or silver | 1,527,438 | $80,590 | Red, or sockeye | 610,323 | $33,997 |
| Chum, or keta | 8,749 | 317 | Total | 3,912,918 | 284,133 |
| Pink, or humpback | 500 | 10 | | | |
| King, or spring | 1,765,908 | 169,219 | | | |

## FREEZING

The freezing of salmon in Alaska is largely incidental to mild curing and other branches of the fisheries. One hundred and three white shoresmen, not elsewhere recorded, were identified with this industry. An outstanding feature of the industry in 1939 was the quick-freezing of a substantial quantity of salmon steaks and fillets by the Alaska Pacific Salmon Co. at Ketchikan and Sand Point. At the former plant, the production consisted of coho salmon and a small quantity of kings, while at the latter pink salmon were frozen.

The total output of frozen salmon in 1939 was 4,352,714 pounds, valued at $340,133, as compared with 7,185,046 pounds valued at $530,951 in 1938—a decrease of 39 percent in quantity and about 36 percent in value. The foregoing products for 1939 include 308,761 pounds of frozen steaks and fillets, valued at $36,914. Except for 186,626 pounds of pink salmon steaks and fillets from Sand Point, in central Alaska, the entire production of frozen salmon was from the southeastern district.

Frozen salmon used as bait in the halibut fishery or as animal feed on fur farms are not included in the above figures but are shown under miscellaneous salmon products.

*Products of Alaska frozen-salmon industry in 1939*

| Species | Pounds | Value | Species | Pounds | Value |
|---|---|---|---|---|---|
| Coho, or silver | [1] 2,142,008 | $170,940 | King, or spring | [3] 1,510,727 | $134,699 |
| Chum, or keta | 497,897 | 18,778 | | | |
| Pink, or humpback | [2] 202,082 | 15,716 | Total | 4,352,714 | 340,133 |

[1] Includes 117,110 pounds of quick-frozen steaks and fillets, valued at $21,078.
[2] Includes 186,626 pounds of quick-frozen steaks and fillets, valued at $14,930.
[3] Includes 5,035 pounds of quick-frozen salmon, valued at $906.

## DRY-SALTED, DRIED, AND OTHER MISCELLANEOUS SALMON PRODUCTS

Miscellaneous salmon products reported for southeast Alaska in 1939 consisted of 24,603 pounds of fresh salmon sold to halibut fishermen for bait, valued at $200, and 155,205 pounds of frozen salmon for bait and mink feed, valued at $1,551.

Three outfits in central Alaska prepared a small pack of canned smoked salmon, the total production amounting to 141 cases of cohos packed in one-half-pound cans, 48 to the case, valued at $927; 31 cases of cohos, 48 1-pound cans to the case, valued at $465; and 7 cases of red salmon, 48 half-pound cans to the case, valued at $49. In this district, also, there were produced 5,523 pounds of dry-salted salmon, valued at $406.

Products of the Yukon, Tanana, and Kuskokwim Rivers included 3,200 pounds of dry-salted salmon, valued at $320, and 456,000 pounds of dried salmon, valued at $36,500. Sixteen whites and 767 natives engaged in the fishery, and the apparatus used consisted of 247 wheels, 545 gill nets of 13,710 fathoms, 2 dories, and 50 rowboats and skiffs.

*Production of dry-salted, dried, and other miscellaneous salmon products in Alaska in 1939*

| Products | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Dry-salted: | | | | | | | | |
| Coho, or silver | | | 4,461 | $319 | | | 4,461 | $319 |
| King, or spring | | | | | 3,200 | $320 | 3,200 | 320 |
| Red, or sockeye | | | 1,062 | 87 | | | 1,062 | 87 |
| Total | | | 5,523 | 406 | 3,200 | 320 | 8,723 | 726 |
| Dried: | | | | | | | | |
| Chum, or keta | | | | | 402,000 | 32,000 | 402,000 | 32,000 |
| King, or spring | | | | | 42,000 | 3,600 | 42,000 | 3,600 |
| Red, or sockeye | | | | | 12,000 | 900 | 12,000 | 900 |
| Total | | | | | 456,000 | 36,500 | 456,000 | 36,500 |
| Smoked and canned: | | | | | | | | |
| Coho, or silver | | | 4,872 | 1,392 | | | 4,872 | 1,392 |
| Red, or sockeye | | | 168 | 49 | | | 168 | 49 |
| Total | | | 5,040 | 1,441 | | | 5,040 | 1,441 |
| Fresh for bait: | | | | | | | | |
| Coho, or silver | 270 | $3 | | | | | 270 | 3 |
| Chum, or keta | 24,333 | 197 | | | | | 24,333 | 197 |
| Total | 24,603 | 200 | | | | | 24,603 | 200 |
| Frozen for bait and mink feed: | | | | | | | | |
| Coho, or silver | 2,650 | 26 | | | | | 2,650 | 26 |
| Chum, or keta | 72,535 | 725 | | | | | 72,535 | 725 |
| Pink, or humpback | 80,020 | 800 | | | | | 80,020 | 800 |
| Total | 155,205 | 1,551 | | | | | 155,205 | 1,551 |
| Grand total | 179,808 | 1,751 | 10,563 | 1,847 | 459,200 | 36,820 | 649,571 | 40,418 |

### Byproducts

In southeast Alaska one plant was engaged in the manufacture of salmon meal and oil, its operations being on virtually the same scale as in the previous year. A salmon cannery on Larsen Bay, in the central district, again produced a limited quantity of salmon byproducts in connection with its canning operations. Employees credited to the industry numbered 24 white shoresmen and 2 white transporters.

Products in 1939 consisted of 1,704,715 pounds of meal, valued at $35,184, and 68,715 gallons of oil, valued at $21,682, as compared with 2,074,000 pounds of meal, valued at $31,413, and 67,988 gallons of oil, valued at $15,757, in 1938—a decrease of about 18 percent in the output of meal and an increase of 1 percent in the output of oil.

## HERRING

Although the output of Scotch-cured herring increased somewhat from that of the previous year, the bulk of the herring catch again went into the manufacture of meal and oil. In southeastern Alaska no salteries were operated, and the only herring products other than those of the reduction plants were bait for the halibut fishermen and a small quantity used for feed on fur farms. All the other important producing centers showed some gain over the previous year in the amount of cured herring, the chief increase being in the Kodiak area. Nearly 45 percent of the total output of Scotch-cured herring for the season came from that area, 33 percent from Prince William Sound, and 22 percent from western Alaska. Each of these areas also produced limited quantities of other cured herring, principally bloater stock. Operators on Cook Inlet prepared 18,300 pounds of pickled herring, most of which was Norwegian cured.

A further shift of operations from southeastern to central Alaska was noticeable. In the former district only 4 herring reduction plants were operated, the fewest since 1922, while in the central district the number rose to 12, or 2 more than had ever before been engaged in the industry there. Of these 2 additional plants, 1 was operated by the Northwestern Herring Co. on Drier Bay, in the Prince William Sound area, and the other was operated by the Chatham Strait Fish Co. on Zachar Bay, in the Kodiak area. Both these companies had formerly owned herring plants in southeastern Alaska. Their operations in the central district were carried on in buildings which had at one time been used as salmon canneries. In all, 7 plants on Prince William Sound and 5 in the Kodiak area were engaged in the manufacture of herring meal and oil.

In view of the proposed expansion of herring-reduction operations in the Kodiak and Prince William Sound areas, and in order to prevent a repetition there of the disastrous results of overfishing which had occurred in the Cook Inlet area and in parts of southeastern Alaska, the Department announced under date of March 24, 1939, that any such expansion which might threaten depletion of the herring resources would necessitate further restriction on fishing. Upon the basis of the average catches in recent years, production limits of 200,000 barrels of herring for the Kodiak area and 350,000 barrels for the Prince William Sound area were tentatively established.

As the season advanced, however, it became apparent that the herring stocks in these two areas were well above the average, and the quotas were accordingly revised to permit an additional catch of 100,000 barrels in each area. This limit was reached in the Kodiak area, and commercial fishing there, except by gill nets or for bait purposes, was closed at 6 o'clock postmeridian August 22. In the Prince William Sound area the rate of production declined toward the end of the season, and the catch amounted to about 422,000 barrels when commercial fishing other than for bait was prohibited at the close of September 25.

There was evidence of severe depletion of herring in southeastern Alaska, and the regulations at the beginning of the year prohibited all commercial fishing for herring, except for bait purposes, in the vicinity of Cape Ommaney. Subsequent large catches of herring from the Cape Ommaney population in the Sitka region necessitated further drastic curtailment, and commercial fishing for herring other than for bait purposes was prohibited after August 2. The small production of herring in southeastern Alaska, therefore, was owing both to the depleted condition of the herring population and to the drastic restrictions applied there.

Notwithstanding the curtailment in southeastern Alaska, the production of herring meal and oil in the Territory as a whole was the second largest in the history of the industry, exceeded only by that of 1937. There were 15,737,769 pounds of meal and 2,220,979 gallons of oil produced in the Prince William Sound area, or 47 percent of the total output of each. The production in the Kodiak area amounted to 11,028,640 pounds of meal and 1,725,965 gallons of oil, or 33 percent and 36 percent of the total, respectively; while southeast Alaska produced the remaining 6,484,688 pounds of meal and 821,639 gallons of oil, representing 20 percent and 17 percent of these respective products.

As in the previous year, a supply of frozen herring for bait was imported from Prince Rupert, owing to a shortage in the southeastern Alaska area during part of the season.

Eighteen concerns handled herring in southeast Alaska, including 6 cold-storage plants that froze herring for bait and 8 outfits engaged solely in the production of bait herring. The 4 reduction plants which operated in the district were as follows:

| | |
|---|---|
| Arentsen & Co | Big Port Walter. |
| Atlas Packing Corporation | Deep Cove. |
| Buchan & Heinen Packing Co | Port Armstrong. |
| Storfold & Grondahl Packing Co | Washington Bay. |

Of the 12 plants in central Alaska which manufactured herring oil and meal, 5 packed Scotch-cured herring also, 1 packed Norwegian-cured herring, and 2 others produced some bloater stock. The principal herring operators in central Alaska were as follows:

| | |
|---|---|
| Saltery and reduction plants— | |
| Apex Fish Co | Port Wakefield. |
| Chatham Strait Fish Co | Crab Bay. |
| W. J. Imlach | Port Benny. |
| Oceanic Fisheries Co., Inc | Port Oceanic and Port Vita. |
| Perfection Fisheries, Inc | Thumb Bay. |
| San Juan Fishing & Packing Co | Port San Juan. |
| Shepard Point Packing Co | Port Ashton. |
| Reduction plants— | |
| Chatham Strait Fish Co | Zachar Bay. |
| George Hogg & Co | Blue Fox Bay. |
| Northwestern Herring Co | Drier Bay. |
| Southwestern Herring, Inc | Iron Creek. |

In western Alaska five plants produced pickled herring, consisting of the Scotch-cured product and bloater stock. One of these plants was engaged primarily in the cod fishery. The following were the principal operators in the western district:

| | |
|---|---|
| Alaska Commercial Co | Unalaska. |
| Jordon Colombos Lambides | Dutch Harbor. |
| Golovin Bay Packing Co | Golovin. |
| Hovland & Nesskaug | Dutch Harbor. |

Studies of the life history and fluctuations in the abundance of the herring populations in southeastern Alaska and in the Prince William Sound and Kodiak areas were continued by Edwin H. Dahlgren, Associate Aquatic Biologist, and one assistant.

## STATISTICAL SUMMARY

There were 1,060 persons engaged in the herring industry in 1939, as compared with 940 in 1938. The number of plants increased from 17 to 21. Products of the fishery were valued at $2,090,473, an increase of $37,389, or about 2 percent over 1938, when the total value was $2,053,084. Scotch-cured herring increased from 2,186,150 pounds, valued at $130,424, to 2,857,863 pounds, valued at $185,091, or about 31 percent in quantity and about 42 percent in value. Herring for bait decreased from 6,143,768 pounds, valued at $61,802, to 5,278,670 pounds, valued at $50,151, or 14 percent in quantity and about 19 percent in value. Meal increased 3 percent in quantity and about 26 percent in value, and oil increased 5 percent in quantity but decreased nearly 12 percent in value.

*Persons engaged, wages paid, and operating units, Alaska herring industry, 1939*

| Item | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| PERSONS ENGAGED | | | | |
| Fishermen: | | | | |
| Whites | 207 | 363 | 5 | 575 |
| Natives | 15 | | 4 | 19 |
| Total | 222 | 363 | 9 | 594 |
| Shoresmen: | | | | |
| Whites | 83 | 358 | 7 | 448 |
| Natives | | | 18 | 18 |
| Total | 83 | 358 | 25 | 466 |
| Grand total | 305 | 721 | 34 | 1,060 |
| Wages paid shoresmen | $50,154 | $218,812 | $6,457 | $275,423 |
| OPERATING UNITS | | | | |
| Plants; shore | 4 | 13 | 4 | 21 |
| Vessels: | | | | |
| Power, over 5 tons | 32 | 48 | | 80 |
| Net tonnage | 1,009 | 2,244 | | 3,253 |
| Launch | | | 1 | 1 |
| Gill net boats | | | 3 | 3 |
| Power dories | 1 | | 1 | 2 |
| Seine skiffs | 13 | 16 | 1 | 30 |
| Other rowboats and skiffs | 10 | 4 | 1 | 15 |
| Lighters and scows | 2 | | | 2 |
| Pile driver | | 1 | | 1 |
| Apparatus: | | | | |
| Purse seines | 31 | 48 | | 79 |
| Fathoms | 5,152 | 8,225 | | 13,377 |
| Beach seines | | 2 | | 2 |
| Fathoms | | 190 | | 190 |
| Gill nets | | | 40 | 40 |
| Fathoms | | | 870 | 870 |
| Pound seines | 9 | | | 9 |
| Pounds | 4 | | | 4 |

*Products of Alaska herring industry in 1939*

| Item | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Fresh, for bait | 2, 135, 010 | $26, 227 | 5, 000 | $50 | | | 2, 140, 010 | $26, 277 |
| Frozen, for bait | 3, 138, 660 | 23, 874 | | | | | 3, 138, 660 | 23, 874 |
| Frozen, for fur farms | 15, 700 | 97 | | | | | 15, 700 | 97 |
| Pickled, for food: | | | | | | | | |
| Scotch cure | | | 2, 233, 563 | 153, 413 | 624, 300 | $31, 678 | 2, 857, 863 | 185, 091 |
| Norwegian cure | | | 32, 550 | 2, 805 | | | 32, 550 | 2, 805 |
| Roused for food (bloater stock) | | | 169, 890 | 4, 074 | 338, 400 | 10, 764 | 508, 290 | 14, 838 |
| Dry salted | | | 63, 200 | 5, 080 | | | 63, 200 | 5, 080 |
| Meal | 6, 484, 688 | 141, 136 | 26, 766, 409 | 549, 721 | | | 33, 251, 097 | 690, 857 |
| Oil | [1] 6,162, 293 | 203, 906 | [2] 29,602, 080 | 937, 648 | | | [3] 35, 764, 373 | 1, 141, 554 |
| Total | 17, 936, 351 | 395, 240 | 58, 872, 692 | 1, 652, 791 | 962, 700 | 42, 442 | 77, 771, 743 | 2, 090, 473 |

[1] 821,639 gallons.

[2] 3,946,944 gallons.

[3] 4,768,583 gallons.

## HALIBUT

A program of voluntary control of production by the halibut fleet was again in effect throughout the season. Under this program departure of vessels for specific areas was made at prescribed intervals, catch limits per man per trip were observed, and the vessels were laid up at port for definite periods between trips. These measures were adopted to prevent concentration of landings with ensuing depression of prices.

Operations in the halibut industry were controlled also by regulations of the International Fisheries Commission, among the more important provisions of which was the establishment of quotas for the various areas. The season opened on April 1; in Area 2 it closed on July 29 and in Area 3 on October 28. The closing dates set for Areas 2 and 3 apply to Areas 1 and 4, respectively.

Halibut livers, from which medicinal oil is extracted, were again sold under contract at 50 cents per pound, and there was likewise some sale of viscera, although in much smaller quantity than that reported for the previous year.

Biological studies of the Pacific halibut were continued by the International Fisheries Commission. The work was under the direction of Dr. W. F. Thompson until July, when he was detailed to investigations of sockeye salmon problems, after which H. A. Dunlop served as acting director. The schooner *Eagle* was chartered for a cruise off Queen Charlotte Islands for studies of halibut eggs and ocean currents in the 1938–39 season.

### STATISTICAL SUMMARY

Seven hundred and ten persons were employed in the Alaska halibut fishery in 1939—a decrease of 15 from the number reported for the preceding year; and products, exclusive of livers and viscera, amounted to 13,454,471 pounds, valued at $893,686. This production represents the total fares of the Alaska halibut fleet, which comprises all American vessels landing more than one-half of their catch in Alaska or British Columbia ports rather than in the States. Landings of halibut, exclusive of livers and viscera, in Alaska totaled 6,994,639 pounds, valued at $412,963, which include 15,000 pounds valued at

$1,000 landed by Canadian vessels. In 1938 the landings of the Alaska fleet were 13,556,355 pounds, valued at $890,301, and landings in Alaska amounted to 8,296,907 pounds, valued at $499,472. Fares of the Alaska fleet in 1939, therefore, decreased about 1 percent in quantity but increased about one-half of 1 percent in value from 1938. The landings in Alaska ports in 1939 decreased about 16 percent in quantity and 17 percent in value from the preceding year.

The amount of halibut livers landed by the Alaska fleet was not reported, but it was stated that there were altogether about 878,000 pounds of halibut, sablefish, "lingcod," rockfish, and soupfin-shark livers, valued at about $407,000, landed at Alaska and Pacific coast ports during 1939 by American vessels, as compared with 866,000 pounds, valued at $405,000, landed by American vessels in 1938. The estimated amount of halibut livers landed in Alaska was 109,800 pounds, valued at $54,900.

Halibut and sablefish viscera landed by the American fleet amounted to 149,000 pounds, valued at about $15,000. The amount of halibut viscera reported as landed in Alaska was 1,116 pounds, valued at $78.

These statistics were compiled from data collected by the International Fisheries Commission and by agents of the Bureau.

*Persons engaged, wages paid, and operating units, Alaska halibut industry, 1939*

| Item | Total | Item | Total |
|---|---|---|---|
| PERSONS ENGAGED | | OPERATING UNITS | |
| Fishermen: Whites | 642 | Vessels: | |
| | | Power, over 5 tons | 118 |
| Shoresmen: | | Net tonnage | 1,718 |
| Whites | 62 | Launches | 32 |
| Natives | 6 | Skates of lines | 3,100 |
| Total | 68 | | |
| Grand total | 710 | | |
| Wages paid shoresmen | $17,907 | | |

*Products of the Alaska halibut fishery in 1939*

| Products | Pounds | Value |
|---|---|---|
| Fresh (including local) | 7,082,658 | $513,611 |
| Frozen | 6,344,678 | 375,191 |
| Fillets, quick frozen | 27,135 | 4,884 |
| Livers [1] | 109,800 | 54,900 |
| Viscera | 1,116 | 78 |
| Total | 13,565,387 | 948,664 |

[1] The amount landed by the Alaska fleet was not segregated; the quantity shown herein is the estimated amount landed in Alaska.

## COD

Cod fishing from shore stations in Alaska was carried on chiefly, as for a number of years past, by various independent fishermen in the Shumagin, Sanak, and Aleutian Islands, partly in connection with salmon and herring pickling. Twenty-four whites and 20 natives were engaged in the industry, including men aboard the power schooner *Dorothea,* which was leased for one trip to the westward during the season. Products amounted to 172,358 pounds of dry-salted cod, valued at $9,645; 127,651 pounds of pickled cod, valued at $6,905; and 5,800 pounds of stockfish, valued at $741—a total of 305,809 pounds, valued at $17,291, as compared with 288,541 pounds valued at $16,181 in 1938.

Three sailing vessels comprised the Bering Sea fleet, the products of which are not included with the Alaska fisheries output because the vessels operate from and land their fares in ports of the Pacific Coast States. Of these vessels, the *Sophie Christenson* (570 tons) was operated by the Pacific Coast Codfish Co., and the *Azalea* (363 tons) and the *Wawona* (413 tons) were operated by the Robinson Fisheries Co.

Products of the offshore fishery were 3,062,000 pounds of dry-salted cod, valued at $125,000, and 15,300 pounds of tongues, valued at $1,530—a total of 3,077,300 pounds, valued at $126,530, as compared with 3,079,775 pounds, valued at $130,912, in 1938. The offshore fishery employed 106 persons, or 2 more than in the previous year.

## WHALES

The Akutan station of the American Pacific Whaling Co. was the only whaling plant operated in Alaska in 1939. This plant employed 109 persons, of whom 95 were whites and 14 were natives. Three steam whalers were operated, or 2 less than the number used in the preceding year, and 171 whales were taken, consisting of 91 finback, 26 humpback, 5 sulphur bottom, and 49 sperm whales.

No changes were made during 1939 in the regulations governing operations in the whaling industry in Alaska. An officer of the Coast Guard was on duty at the Akutan station during the season to enforce the provisions of the Whaling Treaty Act and the regulations issued thereunder. Statistical and biological data were collected by the Bureau for forwarding through the State Department to the International Bureau for Whaling Statistics, Oslo, Norway.

Whale products in 1939 amounted to 246,600 gallons of body oil, valued at $85,915; 132,750 gallons of sperm oil, valued at $33,188; 321 tons of meal from meat, valued at $12,469; 180 tons of bone meal, valued at $4,959; and 8,200 pounds of sperm jawbone, valued at $410—a total value of $136,941, as compared with $179,641 in 1938.

## CLAMS

Operations in the clam-canning industry were on about the same scale as in other recent years and were carried on primarily in the vicinity of Cordova, which produced nearly 99 percent of the season's total output of clams in Alaska.

The clam fishery regulations for 1939 permitted an increased take of clams in the Prince William Sound-Copper River region, the limitation on the catch for the first half year being placed at 1,600,000 pounds of razor clams, including shells, instead of 1,200,000 pounds as in the previous year. In order to prevent depletion and to assure that this increase might be effected only through extension of digging operations to outlying beaches, it was provided that in the section bounded on the west by Strawberry Point Channel, on the north by a line from the southern extremity of Mummy Island to Wireless Point, and on the east by a line from Government Rock to the west end of First Egg Island, the commercial taking of razor clams would be prohibited for the remainder of the calendar year after a combined total of 800,000 pounds, including shells, had been taken in the Prince William Sound and Copper River areas.

The limitation for the more accessible section was reached on May 22, but the quota for the district as a whole was not attained, notwithstanding favorable weather and the good condition of the clam beds. Owing to price disagreements with the Clam Diggers Union, the larger plants did not start packing clams until after May 1, and before the end of the month such operations were curtailed or entirely suspended for a number of weeks in order that the facilities might be devoted to the canning of Copper River red salmon. Many of the clam diggers were placed on limit, both by the packers and by the union. Despite these drawbacks, the season's output in this region was somewhat larger than in the previous year.

An analysis of catch samples in the Cordova district indicated that 44 percent of the total catch was made up of clams from 9 to 14 years of age, compared with 35 percent in 1938. The predominant age group was 8-year-olds, which comprised 24 percent of the season's total, as against about 32 percent in the previous year. Approximately 68 percent of the pack this year was put up during May.

The canning of razor clams in the Prince William Sound-Copper River region in 1939 was carried on at 13 plants, some of which were engaged also in the salmon-canning industry, as follows: Arctic Sanitary Packing Co.; Blue Sea Packing Co.; Buck Canning Co.; Christian Bros.; W. R. Gilbert Co., Inc.; E. A. Haltness & Co.; Hawkins Island Packing Co.; M. O. Marcus; Nunez Bros. Packing Corporation; Pioneer Canneries, Inc.; Scotty's Packing Co.; S. E. Smith Packing Co.; and Young & Trones. Several of the small establishments were operated by diggers who were unable to market their catch to the larger plants.

Other producers of canned clams during the season were the Enterprise Sea Food Co., at Ninilchik; the Sandvik Hand Cannery, at Uganik Village; and Nickey Clam & Salmon Cannery, at Ketchikan. The two last-named plants packed butter clams.

There were 528 persons employed, of whom 436 were whites, 83 natives, 7 Filipinos, 1 Japanese, and 1 Kanaka. The total production amounted to 34,195 cases containing 425,205 pounds, valued at $240,511. This represents the "cut-out" or "drained" weight of can contents for whole and minced clams and the gross weight for clam chowder, in accordance with the practice followed in reporting statistics of the clam production in the States. Prior to 1939 the gross weight of canned clams was shown in the annual report of the Alaska fisheries.

Of the total clam production in Alaska—which consisted of 423,165 pounds of razor clams, including 150 pounds of chowder, and 4,080 pounds of butter clams—1,176 pounds of butter clams, valued at $196, were prepared in southeast Alaska and the remainder came from the central district. The season's output represents a decrease of 17 percent in quantity and about 5 percent in value from the output for 1938, when the total included 115,380 pounds (net weight) packed in Alaska from clams obtained from Massett, B. C.

*Products of Alaska clam industry in 1939*

| Item | Cases | Pounds [1] | Value |
|---|---|---|---|
| RAZOR CLAMS | | | |
| Minced: | | | |
| ½-pound cans (48 to case) | 30, 379 | 364, 548 | $212, 422 |
| 10-ounce cans (48 to case) | 2, 522 | 37, 840 | 17, 012 |
| 1-pound cans (48 to case) | 5 | 120 | 45 |
| 20-ounce cans (24 to case) | 221 | 3, 315 | 1, 571 |
| Whole: | | | |
| ½-pound cans (48 to case) | 65 | 780 | 455 |
| 10-ounce cans (48 to case) | 404 | 6, 060 | 3, 557 |
| 1-pound cans (48 to case) | 363 | 8, 712 | 4, 106 |
| 20-ounce cans (24 to case) | 110 | 1, 650 | 829 |
| Chowder: | | | |
| 20-ounce cans (24 to case) | 5 | 150 | 30 |
| Total, razor clams | 34, 074 | 423, 165 | 240, 027 |
| BUTTER CLAMS | | | |
| Minced: | | | |
| ½-pound cans (48 to case) | 72 | 864 | 288 |
| Whole: | | | |
| 1-pound cans (48 to case) | 49 | 1, 176 | 196 |
| Total, butter clams | 121 | 2, 040 | 484 |
| Grand total | 34, 195 | 425, 205 | 240, 511 |

[1] "Cut-out" or "drained" weights of can contents are shown for whole and minced clams, and gross weight for other clam products.

## SHRIMP

Three plants in southeast Alaska were engaged primarily in the shrimp business—Alaskan Glacier Sea Food Co. at Petersburg, and Reliance Shrimp Co. and Wrangell Shrimp Packing Co. at Wrangell. Some cold-packed shrimp was produced also at the salmon and crab cannery of Dean C. Kayler at Petersburg. In the central district there was a small production of shrimp at Cordova and Kachemak Bay, chiefly in conjunction with crab-canning operations.

There were 169 persons engaged in the industry, of whom 34 were whites, 114 natives, 16 Japanese, 3 Filipinos, and 2 Mexicans. Products consisted of 433,623 pounds of cold-packed shrimp meat, valued at $163,653; 3,263 pounds of frozen shrimp meat, valued at $1,305; 827 pounds of fresh shrimp in shell, valued at $124; and 40 cases (480 pounds net) of canned shrimp meat, valued at $400—a total of 438,193 pounds, valued at $165,482. Comparable figures for 1938 show a production of 435,801 pounds, valued at $168,474.

## CRABS

Crab canning in Alaska was not active in 1939, owing to low market levels. The industry again centered in the Cordova region where seven plants packed crab meat during the year, in some instances in conjunction with the canning of clams. The principal operators in this district were the Alaskan Glacier Sea Food Co., Gulf Packing Co., Scotty's Packing Co., and Sheep Bay Mill & Packing Co.

One plant, that of the King Crab Co., operated at Halibut Cove, on Cook Inlet, and three plants handled crabs in southeast Alaska, namely the A R B Packing Co. at Wrangell, Dean C. Kayler at Petersburg, and O. H. Wood at Hoonah.

Although the bulk of the catch was used for canning, some crabs were sold fresh in each district. Except for a limited production of king crab in southeast Alaska and on Cook Inlet, the output consisted of Dungeness crab.

The number of employees credited to the crab industry in 1939 was 209, of whom 154 were whites, 46 natives, 8 Filipinos, and 1 Mexican. Products consisted of 287,500 pounds of canned crab meat, valued at $92,514; 890 pounds of cold-packed meat, valued at $445; 63 pounds of crab meat in bulk, sold locally, valued at $30; and 651 dozen whole crabs in the shell, valued at $1,590. The total output of crab products was 305,498 pounds, valued at $94,579, as compared with 483,276 pounds valued at $172,638 in 1938, a decrease of 37 percent in quantity and 45 percent in value.

*Products of the Alaska crab industry in 1939*

| Product | Southeast Alaska | | | Central Alaska | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | Number | Pounds | Value | Number | Pounds | Value | Number | Pounds | Value |
| DUNGENESS CRABS | | | | | | | | | |
| Canned: | | | | | | | | | |
| ½-pound cans (48 to case)...cases | 1,080 | 25,920 | $8,284 | 6,801 | 163,224 | $51,709 | 7,881 | 189,144 | $59,993 |
| 1-pound cans (24 to case)...do | 321 | 7,704 | 3,082 | ------ | ------ | ------ | 321 | 7,704 | 3,082 |
| 1-pound cans (48 to case)...do | ------ | ------ | ------ | 635 | 30,480 | 10,297 | 635 | 30,480 | 10,297 |
| 20-ounce cans (24 to case)...do | ------ | ------ | ------ | 284 | 8,520 | 2,407 | 284 | 8,520 | 2,407 |
| 20-ounce cans (90 to case)...do | ------ | ------ | ------ | 409 | 46,012 | 14,717 | 409 | 46,012 | 14,717 |
| Cold-packed meat, 5-pound cans | 178 | 890 | 445 | ------ | ------ | ------ | 178 | 890 | 445 |
| Crab meat in bulk...pounds | ------ | ------ | ------ | 63 | 63 | 30 | 63 | 63 | 30 |
| Whole in shell...dozen | 341 | 7,000 | 682 | 272 | 7,995 | 578 | 613 | 14,995 | 1,260 |
| Total, Dungeness crabs | ------ | 41,514 | 12,493 | ------ | 256,294 | 79,738 | ------ | 297,808 | 92,231 |
| KING CRABS | | | | | | | | | |
| Canned, ½-pound cans (48 to case) cases | 88 | 2,112 | 704 | 147 | 3,528 | 1,314 | 235 | 5,640 | 2,018 |
| Whole in shell...dozen | ------ | ------ | ------ | 38 | 2,050 | 330 | 38 | 2,050 | 330 |
| Total, King crabs | 88 | 2,112 | 704 | ------ | 5,578 | 1,644 | ------ | 7,690 | 2,348 |
| Grand total | ------ | 43,626 | 13,197 | ------ | 261,872 | 81,382 | ------ | 305,498 | 94,579 |

NOTE.—The weights of the pack shown are based upon the size of the cans, rather than on the net contents. Half-pound cans contain 6½ ounces of meat; 1-pound cans contain 13 ounces; and No. 2, or 20-ounce cans, contain 16 ounces.

## OYSTERS

An output of 52 gallons (455 pounds) of oysters, valued at $166, was produced in the Ketchikan district in the fall of 1939. This is the first reported commercial production of oysters in Alaska waters, although the experimental cultivation of the species was begun in 1931 and has been carried on from time to time by various growers.

Under the Act of August 2, 1937, for the protection of oyster culture in Alaska, leases of oyster bottoms may be obtained at nominal cost for the bona fide cultivation of oysters for commercial purposes. An application was received in 1939 from Jabine R. Smith, and a 6-year lease was subsequently executed by the Acting Secretary of the Interior in his favor, effective January 1, 1940, for 100 acres of bottoms in Admiralty Cove, Admiralty Island. This is the third lease of the kind for the fostering of oyster growing in Alaska.

### MISCELLANEOUS FISHERY PRODUCTS

As in the previous year, 2 white fishermen in central Alaska caught Dolly Varden trout for commercial purposes, and in southeast Alaska there was an output of this species and of steelheads, for the most part incidental to salmon-canning operations. The entire commercial production of trout, however, was small. The total products reported were as follows: Dolly Vardens, 30,011 pounds fresh, valued at $2,604, and 22,295 pounds frozen, valued at $1,746; steelheads, 2,471 pounds frozen, valued at $214, and 8 cases canned, 48 1-pound cans to the case, valued at $40.

Several other species of minor importance commercially are taken in limited quantities, principally in connection with the halibut fishery, and are landed in ports of Alaska and British Columbia and at Seattle. Such products landed in Alaska in 1939 were as follows: Sablefish, 1,461,627 pounds frozen, valued at $55,820; 164,801 pounds pickled, valued at $7,656; 73,033 pounds of livers, valued at $31,142; and 13,870 pounds of viscera, valued at $971; rockfish, 32,239 pounds frozen, valued at $757; and 37,574 pounds of quick-frozen fillets, valued at $6,763; flounders, 8,400 pounds frozen, valued at $504; and 21,923 pounds of quick-frozen fillets, valued at $3,936; "lingcod," 337 pounds fresh, valued at $3; and 753 pounds of livers, valued at $301.

## FUR-SEAL INDUSTRY

### PRIBILOF ISLANDS

### GENERAL ADMINISTRATIVE WORK

In 1939 there were taken on the Pribilof Island 60,473 fur-seal skins, of which 47,646 were from St. Paul Island and 12,827 from St. George Island. This was the largest take since 1889. Of these skins, 45,506 on St. Paul Island and 100 on St. George Island were taken by stripping and were blubbered before salting; the remainder were taken by the skinning process.

The season's take of sealskins was shipped to St. Louis, Mo., for processing and sale at public auction by the Fouke Fur Co. for the account of the Government under provisions of the contract of June 9, 1939. The share due Canada, as well as that due Japan, will be apportioned from the net proceeds of sale, the former Government having suspended the previous arrangement for taking delivery of the skins in kind, owing to the outbreak of war in Europe.

The byproducts plant on St. Paul Island was again operated, and the output of meal and oil showed a substantial increase over that of the previous year. Sales of meal and oil that were surplus to the needs of the Bureau brought a gross return of $15,567.43.

Attention was given to the feeding and management of foxes on the islands, and the take of fox pelts in the 1939–40 season numbered 1,246 blue and 12 white pelts, a total of 1,258.

Sealing and foxing operations were carried on by Pribilof natives under the direction of the Bureau's staff. Approximately 80 additional natives from the mainland and Aleutian Islands were employed during the summer to assist with fur-seal activities.

The substation which was established on Amchitka Island in 1937 for sea-otter investigations and patrol, and which had been in oper ation each summer since that time, was maintained on a year-round basis during 1939–40.

Important service was rendered by the Coast Guard in providing a patrol for the protection of fur seals and sea otters along the Pacific coast and in Bering Sea, as well as in giving other assistance in the Bureau's work. The Navy Department detailed the U. S. S. *Capella* to carry the annual shipment of supplies from Seattle to the Pribilof Islands and to bring out the season's take of sealskins.

The administration of the fur-seal service suffered a distinct loss in the death of Superintendent Harry J. Christoffers at Seattle on September 8, 1939, after a brief illness. Mr. Christoffers had been identified with the Alaska work of the Bureau since 1911, and for the last 16 years had been in direct charge of fur-seal operations centering at the Pribilof Islands. To his constructive and untiring efforts, more than to those of any other single person, may be attributed the excellent results achieved in the management of the fur-seal industry and the improvements in housing and other conditions for the welfare of the natives.

## Transportation of Supplies

The U. S. S. *Capella* sailed from Seattle on August 2 for the Pribilof Islands with the annual shipment of supplies, which aggregated 2,274 tons of general freight and 455,791 board feet of lumber. Of this total, 1,525 tons of cargo and 323,175 board feet of lumber were for St. Paul Island and 749 tons of cargo and 132,616 board feet of lumber were for St. George Island. The vessel arrived at the islands on August 12.

On the return trip to Seattle, covering the period from August 24 to September 1, the vessel brought out 60,470 fur-seal skins, 489,174 pounds of seal meal, 25 barrels of blubber, and miscellaneous freight. Five passengers for the Bureau returned to Seattle on this trip.

Additional supplies for the Pribilof Islands were shipped during the year on the *Penguin*.

## Power Vessel "Penguin"

Five round trips between Seattle and the Pribilof Islands were made in 1939 by the *Penguin*, carrying passengers and supplies. In addition the vessel performed interisland service and made trips to Indian settlements along the Alaska Peninsula and the Aleutian Islands to transport native laborers hired for fur-seal work at the Pribilofs during the summer. One trip was made to Amchitka Island in July in connection with the sea-otter patrol.

A full cargo of freight, chiefly perishable foodstuffs, was carried on each trip from Seattle, and outgoing shipments from the Islands included the 1938–39 take of fox skins, transported to Seattle in March, and the fur-seal oil produced at the byproducts plant on St. Paul Island, which was brought out in August and November. A shipment of live white foxes was transported from the Pribilofs to Petersburg, Alaska, in November, and delivered to the Alaska Game Commission to be used at the Petersburg Experimental Fur Farm for experimentation in crossbreeding.

The north-bound voyages of the *Penguin* were as follows: February 16–March 3, May 1–13, June 10–22, September 6–19, and October

21–November 6. South-bound voyages covered the following periods: March 18–31, May 22–June 2, July 30–August 11, September 22–October 5, and November 12–26. On these voyages transportation was furnished to 76 passengers for the Bureau, including 25 employees of the Fouke Fur Co. who assisted with the season's sealing activities at the Islands and 3 connected with the Bureau's salmon investigations in the Kodiak area. The vessel also transported 13 passengers for the Navy, 8 for the Office of Indian Affairs, 3 for the Department of Justice, 2 for the Coast Guard, 11 for the Coast and Geodetic Survey, and 8 unofficial travelers.

The *Penguin* cruised 29,210 nautical miles during the year.

## Roads

*St. Paul Island.*—No road work was done at St. Paul Island other than the upkeep and improvement of roads already in use. The Northeast Point Road was widened and straightened, and the plank section extending the entire length of Big Lake was covered with scoria, the low spots being filled to a more uniform grade. The section of Northeast Point Road which crosses the big sand dune was elevated by a scoria fill to 12 inches above the level of drifting sand, in order that the wind might keep the surface of the road swept clear.

*St. George Island.*—Soon after the completion of sealing operations repairs and improvements were begun on the village roads, the upkeep of which had received little attention in the past few years. The main road from the center of the village to the landing was widened several feet and fills were made in low places. Additional surfacing and grading were done on other village roads, large rocks were removed, and ditches and culverts were constructed at various points. Lateral branches were made from the village road to the new native bunkhouse and to the canteen, and the road in the rear of the cottages of white employees was widened and repaired. Repairs and resurfacing of parts of Zapadni Road included the replacement of several hundred feet of planking with scoria fill.

## Buildings

*St. Paul Island.*—Construction of four new frame houses for natives on St. Paul Island was begun in the fall of 1939. One of these has five rooms and each of the others has three. All have the same floor plan as the three-room native houses built in former years, but the pitch of the roof has been raised to permit the addition of two rooms on the second floor. Three frame houses built for natives in 1918 were moved a short distance to bring them in line with other native dwellings and were placed upon new concrete foundations. In order to make the living quarters more habitable, nine outside laundry houses for natives were built and partial basements for laundry purposes were constructed beneath several houses, under the direction of the Bureau foreman.

The new machine shop was virtually completed. Other permanent improvements included an addition to the boatways, the erection of a small pump house, and the building of a reindeer corral.

*St. George Island.*—The bunkhouse for natives on St. George Island was completed. Fences and cement sidewalks were placed around the cottages for white employees, and a stock fence to keep out animals was built around the upper lake which is the source of the village water supply. A small building was constructed to house the tractor hoist at the village landing.

### BYPRODUCTS PLANT

The byproducts plant on St. Paul Island was in operation from June 19 to July 27, rendering oil and meal from seal carcasses and blubber. The direct cost of operation during the season was $10,316.60. The total production amounted to 514 barrels, or 28,020.23 gallons, of fur-seal blubber oil, 4,789 gallons of oil from seal carcasses, and 502,914 pounds of seal meal. As a result of processing the blubber and carcasses separately this season, the bulk of the oil produced was of a very high grade.

The entire production of oil from carcasses and one barrel of blubber oil were retained at the Islands for use in fox feed and for other purposes. The remainder of the blubber oil, amounting to 27,965.73 gallons, was shipped to Seattle on the *Penguin* and sold by competitive bidding for 31⅛ cents per gallon, or a total of $8,704.33.

The U. S. S. *Capella* brought 489,174 pounds of seal meal to Seattle in August. About 75 tons of this meal was delivered to the Division of Fish Culture for use in Federal fish hatcheries, and the remainder was sold through competitive bidding. In all, 338,421 pounds of meal were sold for a gross sum of $6,863.10. About 5 tons were sold at $50 per ton to the Division of Fish and Game of the State of Montana, and about 164 tons were sold at $40.25 to Wilbur-Ellis Co., Seattle. This is the first time since 1921 that any of the seal meal produced at the Pribilof Islands has been sold for the account of the Government. Thirteen thousand pounds of meal were retained at the Islands for use in fox feed and 740 pounds were transferred for use of natives along the coast of northwest Alaska.

The total sales of seal oil and meal in 1939 aggregated $15,567.43. In addition, the Fouke Fur Co. paid $44.91 for the 25 barrels of blubber which it obtained from the Islands, in accordance with provisions of the 1939 contract, the value being based upon the value of the oil which might have been derived therefrom at the Bureau's byproducts plant, less the estimated cost of its production. The total sales of all byproducts, therefore, amounted to $15,612.34.

### NATIVES

#### CENSUS

On December 31, 1939, the total native population of St. Paul Island was 274, including 8 persons who were temporarily absent from the Island. There were 10 births and 3 deaths during the year. Three natives, as follows, from the Alaska Peninsula became residents of St. Paul Island during the year: one, a 2-year-old boy, who was legally adopted into a native family; another, a girl who had been listed among the permanent departures in 1938 and who returned to live on St. Paul Island; and the third, the wife of a St. Paul Island native married at Unalaska in October 1938. One native left the Island to become a permanent resident of St. George Island.

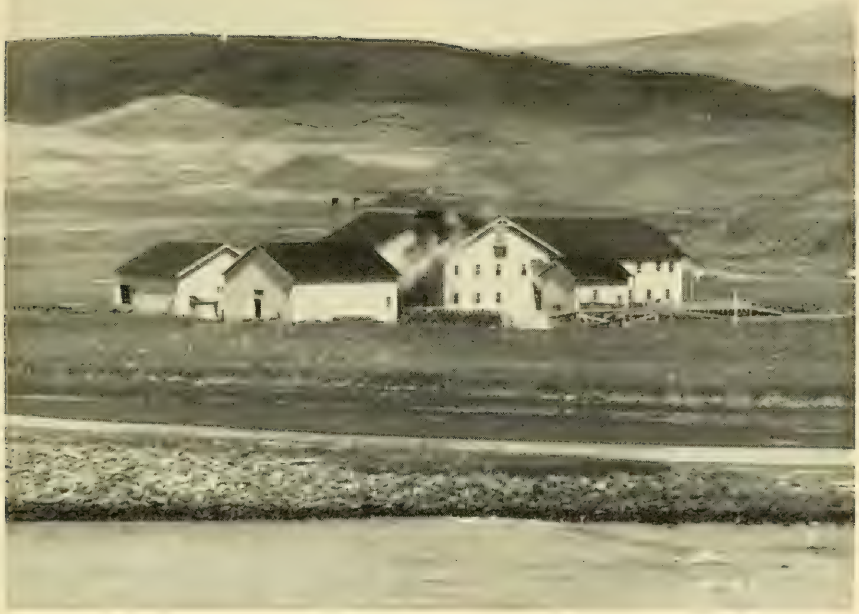

FIGURE 5.—Fur-seal byproducts plant, St. Paul Island, Alaska.

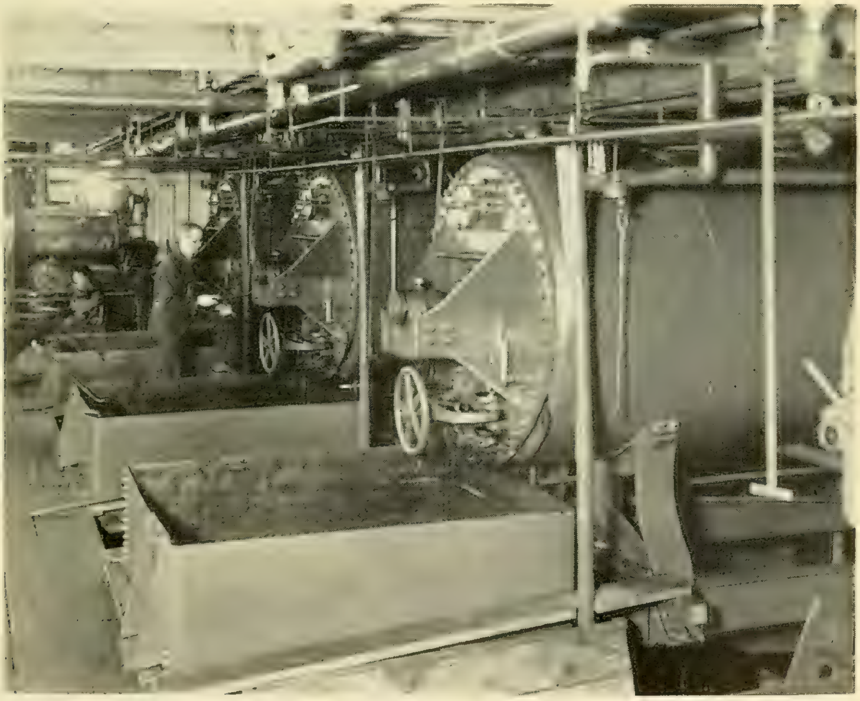

FIGURE 6.—Interior view, fur-seal byproducts plant, St. Paul Island, Alaska.

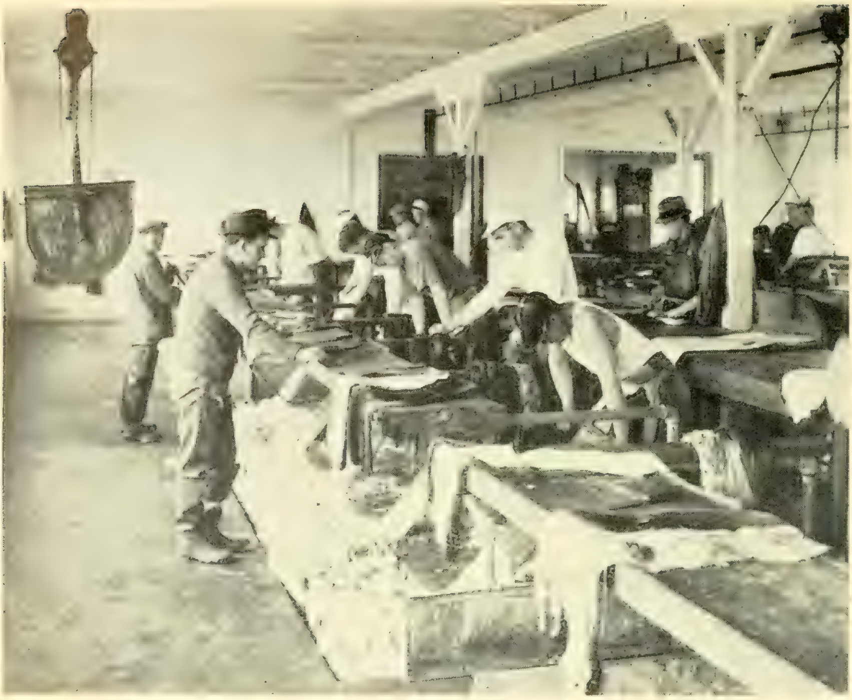

FIGURE 7.—Removing blubber from fur-seal skins, St. Paul Island, Alaska.

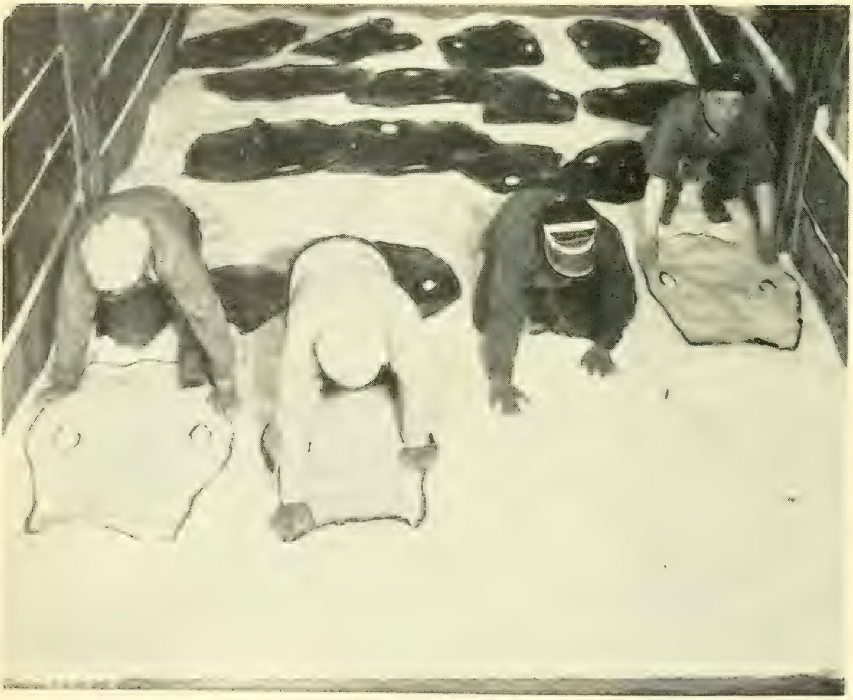

FIGURE 8.—Kenching (salting) fur-seal skins, St. Paul Island, Alaska.

The census on St. George Island on December 31, 1939, showed a population of 176 natives, including 1 who moved there from St. Paul Island, and an orphan child from Unalaska who was adopted into her married sister's family under authorization by the Commissioner of Fisheries, upon recommendation of the superintendent of the Pribilof Islands. The child is the daughter of a native woman born on St. George Island who moved to Unalaska following her marriage to a native of that village. There were 7 births and 2 deaths during the year.

The total native population of both Islands at the end of 1939 was 450.

### MEDICAL SERVICE

Two physicians at the Pribilof Islands rendered medical aid to the natives and the Government employees residing there. Health conditions in general were satisfactory, and there were no epidemics of a serious nature.

A summary of the medical services rendered on St. Paul Island for the year ending March 31, 1940, showed, in addition to the periodic examinations of school children and routine health inspections in the village, 1,890 calls made upon the doctor in the dispensary during the year, 151 house calls, and 52 patients admitted to the hospital for a total of 979 days of care. This hospitalization included 12 obstetrical cases, the mothers and babies receiving care for 336 days; 17 surgery cases covering 207 days of care, and 11 medical cases totaling 436 days. Thirty X-ray studies, of one film or more each, were made during the year.

At St. Paul Island on July 1, 1939, a seaman aboard the *Penguin* was found to have contracted measles. A 2 weeks' quarantine was accordingly ordered for all passengers, both white and native, arriving on the vessel, and no other cases of measles developed on the Island.

In January 1940 Carl Loy, employed on sea-otter patrol at Amchitka Island, was stricken with acute appendicitis. Advice and orders for treatment were given by the St. Paul Island physician by radiophone. The patient was removed by special trip of the Coast Guard cutter *Haida* to Unalaska, where a successful appendectomy was performed in February.

On St. George Island, which is provided with a dispensary but no hospital, the physician extended medical service to the natives in 2,652 cases, including office and home calls, during the year ending March 31, 1940. A native woman was sent to Seattle on the *Penguin* in November for diagnosis and treatment in the hospital of the Office of Indian Affairs at Tacoma, Wash., and a native man made the trip to the States on the March sailing of the vessel for an operation at the same hospital.

In order to benefit the medical service on St. George Island, it is planned that a hospital will be established there similar to the one which has been in use on St. Paul Island since 1931.

A dentist was on duty at the Islands throughout the year. During the absence of a physician on St. Paul Island from March 18 to May 15 the dentist was in charge of the dispensary and hospital there. The dental work completed in the fiscal year ending March 31, 1940, included 92 dentures, 408 fillings, 250 extractions. 4 bridges, 4 inlays, and 15 plate and bridge repairs.

## SCHOOLS

Schools for the natives are maintained by the Bureau on St. Paul and St. George Islands, and all natives between the ages of 6 and 16 are required to attend unless excused on account of illness. Two teachers are employed on each Island. Instruction is confined to the elementary branches, manual arts, and home economics.

The 1938–39 school year began on September 12 on both Islands. It closed on May 12 on St. Paul Island and on May 2 on St. George Island. For 7 days during the year the junior school on St. Paul Island was not in session, owing to the illness of the teacher. The teacher of the senior school on St. George Island left for Seattle on March 6 because of illness, and during the remainder of the term the two schools were taught in rotation by the junior school teacher, each being in half-day session.

On St. Paul Isand there were 13 girls and 26 boys in the junior school and 18 girls and 17 boys in the senior school; a total of 74. Two pupils of school age were not enrolled, as they were sick in the hospital for the entire term. On St. George Island 12 girls and 13 boys were enrolled in the junior school and 15 girls and 10 boys in the senior school; a total enrollment of 50.

## SAVINGS ACCOUNTS

Several natives of the Pribilof Islands have savings accounts in the bank of the Washington Loan & Trust Co., Washington, D. C., on which they receive interest compounded semiannually at the rate of 2 percent. The Commissioner of Fisheries, as trustee, has custody of these funds. The trust account for the year 1939 is summarized as follows:

| | |
|---|---|
| On hand Jan. 1, 1939 | $3, 850. 56 |
| Interest earned from Jan. 1 to Dec. 31, 1939 | 71. 92 |
| Total | 3, 922. 48 |
| Withdrawn by natives | 870. 00 |
| On hand Dec. 31, 1939 | 3, 052. 48 |

The following is an itemized statement of the funds, setting forth the individual accounts:

*Funds of the Pribilof Islands natives in the custody of the United States Commissioner of Fisheries, as trustee, December 31, 1939*

| | | | |
|---|---|---|---|
| Kochutin, Alexandra | $1, 017. 05 | Merculief, Elizabeth | $76. 33 |
| Kozloff, Marina | 142. 65 | Merculief, Erena | 472. 13 |
| Lekanof, Tatiana (Merculief) | 470. 72 | Merculief, George | 15. 86 |
| Lestenkof, Michael | 251. 39 | Pankoff, Agrippina | 218. 83 |
| Merculief, Alexandra | 51. 05 | Total | 3, 052. 48 |
| Merculief, Daniel | 336. 47 | | |

## PAYMENTS FOR TAKING FUR-SEAL SKINS

Natives of the Pribilof Islands are paid for their work in taking sealskins at specified rates per skin. The sealers on each island are divided into classes according to their skill and ability, and the collective earnings are apportioned among them, each worker in a given class receiving an equal share. Small bonuses are paid for special services.

On St. Paul Island the payments to natives in 1939 were at the rate of 60 cents per skin for the 47,646 sealskins taken, or a total of $28,587.60, and in addition $180 was paid to 2 foremen and 4 mess attendants.

Natives on St. George Island were paid at the rate of 75 cents per skin, the total in 1939 amounting to $9,620.25 for the 12,827 sealskins taken, and an additional $120 was paid to 2 native foremen and 1 mess attendant.

Details of these payments are shown in the following table:

*Payments to Pribilof Islands natives for taking fur-seal skins, calendar year 1939*

| Classification | St. Paul Island | | | St. George Island | | |
|---|---|---|---|---|---|---|
| | Number of men | Share of each | Total | Number of men | Share of each | Total |
| First class | 36 | $486.60 | $17,517.60 | 33 | $220.50 | $7,276.50 |
| Second class | 10 | 393.00 | 3,930.00 | 8 | 165.00 | 1,320.00 |
| Third class | 16 | 297.00 | 4,752.00 | 5 | 114.75 | 573.75 |
| Fourth class | 10 | 199.80 | 1,998.00 | 3 | 86.25 | 258.75 |
| Fifth class | 3 | 88.80 | 266.40 | 3 | 63.75 | 191.25 |
| Boys' class | 2 | 37.80 | 75.60 | | | |
| Special boys' class | 4 | 12.00 | 48.00 | | | |
| Foreman (additional compensation) | | | 60.00 | | | 55.00 |
| Do | | | 40.00 | | | 45.00 |
| Mess attendants ($20 each) | | | 80.00 | | | 20.00 |
| Total | 81 | | 28,767.60 | 52 | | 9,740.25 |

## PAYMENTS FOR TAKING FOX SKINS

For taking fox skins on the Pribilof Islands in the 1938–39 season the natives were paid at the rate of $5 per skin. The payments amounted to $1,120 for the 224 fox skins taken on St. Paul Island and $4,025 for the 805 skins taken on St. George Island, a total of $5,145.

## FUR SEALS

### KILLINGS

In 1939, 60,473 fur seals were killed, of which 47,646 were taken on St. Paul Island and 12,827 on St. George Island. Details with regard to the killings are shown in the following tabulations:

*Seal killings on Pribilof Islands in 1939*

ST. PAUL ISLAND

| Date | Serial Number of drive | Hauling ground | Skins secured |
|---|---|---|---|
| June 12 | 1 | Vostochni and Morjovi | 164 |
| 18 | 2 | Tolstoi and Lukanin | 69 |
| 19 | 3 | Zapadni | 165 |
| 20 | 4 | Reef and Gorbatch | 976 |
| 21 | 5 | Polovina and Polovina Cliffs | 101 |
| 22 | 6 | Vostochni and Morjovi | 665 |
| 23 | 7 | Zapadni and Little Zapadni | 298 |
| 24 | 8 | Tolstoi, Lukanin, and Kitovi | 79 |
| 25 | 9 | Reef and Gorbatch | 1,069 |

*Seal killings on Pribilof Islands in 1939*—Continued

ST. PAUL ISLAND—Continued

| Date | Serial Number of drive | Hauling ground | Skins secured |
|---|---|---|---|
| June 26 | 10 | Polovina and Polovina Cliffs | 94 |
| 27 | 11 | Vostochni and Morjovi | 846 |
| 28 | 12 | Zapadni and Little Zapadni | 508 |
| 29 | 13 | Tolstoi, Lukanin, and Kitovi | 150 |
| 30 | 14 | Reef and Gorbatch | 1,933 |
| July 1 | 15 | Polovina, Polovina Cliffs, and Little Polovina | 230 |
| 2 | 16 | Vostochni and Morjovi | 1,630 |
| 3 | 17 | Zapadni and Little Zapadni | 1,313 |
| 4 | 18 | Tolstoi, Lukanin, and Kitovi | 625 |
| 5 | 19 | Reef and Gorbatch | 1,941 |
| 6 | 20 | Polovina, Polovina Cliffs, and Little Polovina | 830 |
| 7 | 21 | Vostochni and Morjovi | 1,684 |
| 8 | 22 | Zapadni and Little Zapadni | 1,590 |
| 9 | 23 | Tolstoi, Lukanin, and Kitovi | 616 |
| 10 | 24 | Reef and Gorbatch | 2,367 |
| 11 | 25 | Polovina, Polovina Cliffs, and Little Polovina | 653 |
| 12 | 26 | Vostochni and Morjovi | 2,700 |
| 13 | 27 | Zapadni and Little Zapadni | 2,345 |
| 14 | 28 | Tolstoi, Lukanin, and Kitovi | 1,081 |
| 15 | 29 | Reef and Gorbatch | 2,566 |
| 16 | 30 | Polovina, Polovina Cliffs, and Little Polovina | 916 |
| 17 | 31 | Vostochni and Morjovi | 2,217 |
| 18 | 32 | Zapadni and Little Zapadni | 1,894 |
| 19 | 33 | Tolstoi, Lukanin, and Kitovi | 1,323 |
| 20 | 34 | Reef and Gorbatch | 2,233 |
| 21 | 35 | Polovina, Polovina Cliffs, and Little Polovina | 838 |
| 22 | 36 | Vostochni and Morjovi | 2,455 |
| 23 | 37 | Zapadni and Little Zapadni | 1,509 |
| 24 | 38 | Tolstoi, Lukanin, and Kitovi | 1,268 |
| 25 | 39 | Reef and Gorbatch | 1,552 |
| 26 | 40 | Vostochni, Morjovi, and Polovina Cliffs | 2,153 |
|  |  | Total | 47,646 |

ST. GEORGE ISLAND

|  |  |  |  |
|---|---|---|---|
| June 5 | 1 | North | 37 |
| 8 | 2 | Zapadni | 21 |
| 12 | 3 | North and Staraya Artil | 62 |
| 14 | 4 | East | 40 |
| 17 | 5 | North and Staraya Artil | 30 |
| 19 | 6 | East | 86 |
| 20 | 7 | Zapadni | 71 |
| 21 | 8 | North and Staraya Artil | 159 |
| 23 | 9 | East | 136 |
| 24 | 10 | Zapadni | 75 |
| 25 | 11 | North and Staraya Artil | 157 |
| 27 | 12 | East | 131 |
| 28 | 13 | Zapadni | 155 |
| 29 | 14 | North and Staraya Artil | 196 |
| July 1 | 15 | East | 303 |
| 2 | 16 | Zapadni | 209 |
| 3 | 17 | North and Staraya Artil | 765 |
| 5 | 18 | East | 319 |
| 6 | 19 | Zapadni | 242 |
| 7 | 20 | North and Staraya Artil | 422 |
| 9 | 21 | East | 516 |
| 10 | 22 | Zapadni | 210 |
| 11 | 23 | North and Staraya Artil | 801 |
| 13 | 24 | East | 665 |
| 14 | 25 | Zapadni | 237 |
| 15 | 26 | North and Staraya Artil | 1,203 |
| 17 | 27 | East | 517 |
| 18 | 28 | Zapadni | 311 |
| 19 | 29 | North and Staraya Artil | 903 |
| 21 | 30 | East | 806 |
| 22 | 31 | Zapadni | 341 |
| 23 | 32 | North and Staraya Artil | 1,455 |
| 25 | 33 | East | 1,019 |
| 26 | 34 | Zapadni | 227 |
|  |  | Total | 12,827 |

### AGE CLASSES

The age class of a male seal of the Pribilof Islands herd is determined from the length of its body. The classification was derived from measurements of a large number of pups branded in 1912 and killed in subsequent years. The limits of the various age classes are shown in the following table:

*Age classes of male seals, Pribilof Islands*

| Age | Length | Age | Length |
|---|---|---|---|
| | *Inches* | | *Inches* |
| Yearlings | Up to 36.75 | 4-year-olds | 46 to 51.75 |
| 2-year-olds | 37 to 40.75 | 5-year-olds | 52 to 57.75 |
| 3-year-olds | 41 to 45.75 | 6-year-olds | 58 to 63.75 |

*Ages of seals killed on Pribilof Islands, calendar year 1939*

[On basis of classification shown in preceding table]

| Age | St. Paul Island | St. George Island | Total |
|---|---|---|---|
| Yearling males | 3 | | 3 |
| 2-year-old males | 893 | 324 | 1,217 |
| 3-year-old males | 44,644 | 11,876 | 56,520 |
| 4-year-old males | 1,999 | 565 | 2,564 |
| 5-year-old males | 8 | | 8 |
| Cows [1] | 99 | 62 | 161 |
| Total | 47,646 | 12,827 | 60,473 |

[1] Cows unavoidably and accidentally killed or found dead.

Some of the seals recorded in the above tabulation as 2-year-olds and 4-year-olds probably were 3-year-olds, as not all male seals of a given age fall within the length limits assigned for the males of that age. As far as possible, however, the killings in 1939 were confined to 3-year-old males.

### COMPUTATION OF FUR-SEAL HERD

The computation of the fur-seal herd in 1939 was made by Supt. H. J. Christoffers, assisted by Edward C. Johnston. As of August 10 the total of all classes was 2,020,774—a numerical increase of 148,336 over the figures for the preceding year. The detailed report will be found on pages 177 to 184 of this document. Following is a comparative statement of the numerical strength of the various elements of the fur-seal herd in the years 1928 to 1939, inclusive:

*General comparison of computations of the seal herd on the Pribilof Islands, 1928 to 1939*

| Classes | 1928 | 1929 | 1930 | 1931 | 1932 | 1933 |
|---|---|---|---|---|---|---|
| Harem bulls | 6, 050 | 7, 187 | 8, 312 | 9, 233 | 10, 088 | 10, 213 |
| Breeding cows | 284, 725 | 307, 491 | 332, 084 | 358, 642 | 387, 320 | 418, 299 |
| Surplus bulls | 5, 285 | 5, 207 | 3, 963 | 3, 291 | 2, 893 | 4, 700 |
| Idle bulls | 1, 449 | 1, 633 | 1, 899 | 1, 888 | 2, 349 | 2, 341 |
| 6-year-old males | 12, 857 | 10, 399 | 5, 612 | 6, 553 | 8, 154 | 9, 335 |
| 5-year-old males | 13, 001 | 7, 016 | 8, 191 | 10, 193 | 11, 669 | 10, 216 |
| 4-year-old males | 7, 798 | 9, 102 | 11, 327 | 12, 966 | 11, 351 | 15, 441 |
| 3-year-old males | 11, 133 | 13, 639 | 14, 871 | 13, 198 | 17, 849 | 18, 216 |
| 2-year-old males | 49, 087 | 64, 354 | 69, 674 | 74, 828 | 81, 101 | 87, 662 |
| Yearling males | [illegible] | 85, 381 | 92, 232 | 99, 612 | 107, 592 | 116, 195 |
| 2-year-old cows | 57, 061 | 67, 210 | 72, 605 | 78, 410 | 84, 682 | 91, 454 |
| Yearling cows | 72, 481 | 85, 417 | 92, 247 | 99, 626 | 107, 593 | 116, 197 |
| Pups | 284, 725 | 307, 491 | 332, 084 | 358, 642 | 387, 320 | 418, 299 |
| Total | [illegible] | 971, 527 | 1, 045, 101 | 1, 127, 082 | 1, 219, 961 | 1, 318, 568 |

| Classes | 1934 | 1935 | 1936 | 1937 | 1938 | 1939 |
|---|---|---|---|---|---|---|
| Harem bulls | 10, 770 | 11, 547 | 12, 321 | 13, 100 | 13, 160 | 10, 980 |
| Breeding cows | 451, 751 | 487, 883 | 526, 848 | 568, 982 | 614, 499 | 663, 634 |
| Surplus bulls | 6, 494 | 6, 139 | 7, 994 | 9, 140 | 7, 277 | 7, 828 |
| Idle bulls | 2, 282 | 2, 535 | 2, 733 | 3, 031 | 2, 125 | 2, 973 |
| 6-year-old males | 8, 172 | 11, 117 | 11, 421 | 15, 188 | 17, 269 | 14, 561 |
| 5-year-old males | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 21, 559 |
| 4-year-old males | 15, 862 | 21, 096 | 23, 991 | 33, 815 | 24, 275 | 26, 486 |
| 3-year-old males | 24, 772 | 28, 165 | 40, 170 | 45, 891 | 32, 278 | 37, 107 |
| 2-year-old males | 94, 920 | 102, 555 | 110, 505 | 118, 889 | 107, 003 | 116, 124 |
| Yearling males | 125, 490 | 135, 525 | 146, 365 | 158, 051 | 142, 232 | 153, 621 |
| 2-year-old cows | 98, 765 | 106, 666 | 115, 197 | 124, 410 | 123, 150 | 132, 999 |
| Yearling cows | 125, 490 | 135, 526 | 146, 365 | 158, 054 | 156, 470 | 168, 955 |
| Pups | 451, 751 | 487, 883 | 526, 848 | 568, 982 | 614, 499 | 663, 634 |
| Total | [illegible] | [illegible] | [illegible] | [illegible] | 1, 872, 495 | 2, 020, 774 |

## FOXES

A noteworthy activity, incidental to and alternating advantageously with the more important sealing operations on the Pribilof Islands, is the care and management of blue foxes which roam at large on the Islands and supply approximately 1,000 pelts annually for market. In the summer the animals subsist chiefly on birds, birds' eggs, and the abundant marine life along the beaches, but in winter, when their natural food is scarce, they are fed prepared rations of cereals and seal meal and oil.

Trapping of the foxes is begun when the pelts reach their prime, about the first of December, and is discontinued at the beginning of the mating season, usually near the end of January, or earlier if necessary for breeding requirements. Box traps are used, and a number of the animals captured are marked and released for the breeding reserve. About 1 percent of each season's catch consists of white foxes, a color phase of the species found at the Islands.

Five live white foxes from St. George Island and one from St. Paul Island, which had been taken at the request of the Alaska Game Commission for cross breeding with blue foxes on the Experimental Fur Farm at Petersburg, were shipped from the Islands on the *Penguin* in November 1939. One of these animals died en route, and the remaining five were delivered to a representative of the Game Commission at Petersburg. This transfer was made with the understanding that the Pribilof foxes would be replaced with others in due time and thus improve the stock at the Islands.

### TRAPPING SEASON OF 1939–40

In the 1939–40 season there were taken 1,258 fox pelts, of which 1,246 were blue and 12 white. Three hundred and seventy-seven blue and 8 white pelts were taken on St. Paul Island and 869 blue and 4 white pelts on St. George Island.

There were trapped, marked, and released for breeding stock 47 male and 44 female foxes on St. Paul Island and 24 males and 32 females on St. George Island. The breeding reserve includes also a considerable number of animals that were not captured during the season.

## REINDEER

*St. Paul Island.*—Upon the basis of observations made during three drives of the entire herd it was estimated that the total number of reindeer on St. Paul Island as of October 14 was 1,800, of which 450 were the young of the season. During the year, 105 animals had been killed, of which 4 were found to be unfit for food. The remaining 101 deer were used for food in white, native, and Aleut messes.

It is believed that the estimate of the size of the herd this year is more accurate than heretofore. Two natives were detailed to the work of herding the reindeer during most of the period from April 1 to November 18, and for a time a third man was so employed.

In the early part of September a reindeer corral was constructed in accordance with specifications prepared in 1937 by a unit manager of the reindeer service of the Office of Indian Affairs. Upon completion of this enclosure, successive roundups and drives were made on September 16, September 30, October 14, and November 14. As a result of the first of these, 36 bucks and 111 does entered the corral. They were held for three days and accepted both water and food. On the next two drives no deer could be induced to enter the compound.

Because of the increasing wariness of the deer, the corral's wings were extended, and additional enclosures were added, doubling its holding capacity from an original 2,500 to 5,000. Long strips of burlap were prepared, to be carried by the drivers, thus effecting a continuous, moving and conspicuous barrier behind the deer. A large crew made the final drive, using the long burlap strips, and almost the entire herd was brought around the north and east sides of Little Polovina Mountain, but when near the corral the deer stampeded, bands of varying sizes charging in different directions, and only 6 bucks and 3 does were herded into the corral.

*St. George Island.*—A count of the reindeer on St. George Island on September 30 showed 42 animals, of which 9 were this year's fawns. The herd appeared to be in good condition.

## FUR-SEAL SKINS

### SHIPMENTS

Seven hundred and eighty-six barrels containing 60,470 fur-seal skins taken on the Pribilof Islands in 1939 were shipped on the U. S. S. *Capella* and arrived at Seattle on September 1. Of these skins, 47,643, packed in 497 barrels, were from St. Paul Island, and 12,827, packed in 289 barrels, were from St. George Island. All were forwarded by freight to the Fouke Fur Co., at St. Louis, Mo.

The foregoing figures include 9,071 sealskins, or 15 percent of the season's take, packed in 118 barrels, allotted to the Canadian Government in accordance with provisions of the fur-seal treaty. Owing to war conditions in Europe, however, Canadian authorities decided to have the shipment consigned to the Fouke Fur Co., and arrangements were made subsequently to have the skins handled with those of the United States, as was the practice prior to 1933.

Twenty-five barrels of salted blubber, having a gross weight of 10,593 pounds, also were brought out on the *Capella* and delivered to the Fouke Fur Co., f. o. b. Seattle, for use in the tanning of sealskins.

Three sealskins, parchment dried for experimental purposes, were brought to Seattle on the *Penguin* in August and were turned over to a representative of the Fouke Fur Co. for transporting to St. Louis.

### SALES

Two public auction sales of fur-seal skins taken on the Pribilof Islands were held in St. Louis in 1939, on May 22 and October 2, respectively, at which there were sold a total of 42,284 skins for a gross sum of $807,677. During the year, also, 787 sealskins taken on the Pribilof Islands were disposed of at private sales, under special authorization of the Secretary, for a total of $16,208.90. In the following detailed statements the sales of other sealskins by the Department for the account of the Government are included, in order that the records may be complete.

*May 22, 1939.*—On May 22, 1939, 20,520 Pribilof Islands fur-seal skins, dressed, dyed, and machined, were sold for $344,338.75. These skins consisted of 7,800 dyed black and 12,720 dyed safari brown. In addition, 210 fur-seal skins taken by the Japanese Government on Robben Island in 1937 and allotted to the United States as its share of such skins under provisions of the fur-seal treaty, were sold for $3,495.50. Of these, 196 finished skins, dyed safari brown, brought $3,492, and the remaining 14 skins, unhaired and dressed, brought $3.50.

*October 2, 1939.*—At the sale on October 2, 21,764 Pribilof Islands fur-seal skins were sold for $463,338.25. Of these, 21,646 dressed, dyed, and machined brought $463,297.75, and 118 raw and partly processed skins brought $40.50. The processed skins consisted of 8,030 dyed black, 8,516 dyed safari brown, and 5,100 dyed matara brown, a recently developed shade which was offered at this sale for the first time.

*Special sales.*—During the year, 787 Pribilof Islands fur-seal skins were sold under special authorization by the Department for advertising and promotional purposes, the gross sales amounting to $16,208.90. Of these skins, 323 dyed black brought $6,312.60; 254 dyed safari brown, $5,117.40; 115 dyed matara brown, $3,759.55; and 95 raw, $1,019.35.

Further details with regard to the sales of sealskins by the Department for the account of the Government in 1939 are given in the following tables:

*Comparative values, by sizes and grades, with percentages each size, of Pribilof sealskins sold at public auction in 1939*

| Classes and sales | Grade | Number | High | Low | Average | Total | Total number | Average price | Total amount | Percentage |
|---|---|---|---|---|---|---|---|---|---|---|
| DYED BLACK | | | | | | | | | | |
| Extra large: | | | | | | | | | | |
| Oct. 2 | I and II | 75 | $23.50 | $22.50 | $23.30 | $1,747.50 | 146 | $21.71 | $3,170.00 | 1.82 |
| | Scarred, faulty, etc | 71 | 21.50 | 17.50 | 20.04 | 1,422.50 | | | | |
| Large: | | | | | | | | | | |
| May 22 | I and II | 770 | 23.50 | 21.00 | 22.09 | 17,010.00 | 1,500 | 20.10 | 30,142.50 | 19.23 |
| | Scarred, faulty, etc | 670 | 19.50 | 18.50 | 19.13 | 12,817.50 | | | | |
| | III | 60 | 5.50 | 5.00 | 5.25 | 315.00 | | | | |
| Oct. 2 | I and II | 1,416 | 23.00 | 21.00 | 22.02 | 31,177.50 | 2,356 | 20.43 | 48,236.50 | 29.34 |
| | Scarred, faulty, etc | 906 | 19.50 | 17.50 | 18.42 | 16,685.00 | | | | |
| | III | 34 | 11.00 | 11.00 | 11.00 | 374.00 | | | | |
| Medium: | | | | | | | | | | |
| May 22 | I and II | 3,000 | 18.50 | 16.50 | 17.39 | 52,160.00 | 5,220 | 15.62 | 81,515.00 | 66.92 |
| | Scarred, faulty, etc | 2,080 | 15.00 | 12.50 | 13.76 | 28,620.00 | | | | |
| | III | 140 | 5.50 | 5.00 | 5.25 | 735.00 | | | | |
| Oct. 2 | I and II | 3,061 | 19.75 | 18.50 | 19.21 | 58,814.75 | 4,919 | 18.19 | 89,465.25 | 61.26 |
| | Scarred, faulty, etc | 1,830 | 17.25 | 15.50 | 16.58 | 30,342.50 | | | | |
| | III | 28 | 11.00 | 11.00 | 11.00 | 308.00 | | | | |
| Small medium: | | | | | | | | | | |
| May 22 | I and II | 630 | 14.50 | 13.50 | 14.13 | 8,898.75 | 1,080 | 13.09 | 14,141.25 | 13.85 |
| | Scarred, faulty, etc | 450 | 12.00 | 11.50 | 11.65 | 5,242.50 | | | | |
| Oct. 2 | I and II | 275 | 16.50 | 14.00 | 15.03 | 4,132.50 | 609 | 14.10 | 8,584.00 | 7.58 |
| | Scarred, faulty, etc | 320 | 13.75 | 13.00 | 13.43 | 4,297.50 | | | | |
| | III | 14 | 11.00 | 11.00 | 11.00 | 154.00 | | | | |
| All classes: | | | | | | | | | | |
| May 22 | | | | | | | 7,800 | 16.13 | 125,798.75 | 100.00 |
| Oct. 2 | | | | | | | 8,030 | 18.61 | 149,455.75 | 100.00 |
| DYED SAFARI BROWN | | | | | | | | | | |
| Wig: | | | | | | | | | | |
| Oct. 2 | II | 1 | 22.50 | 22.50 | 22.50 | 22.50 | 1 | 22.50 | 22.50 | .01 |
| Extra extra large: | | | | | | | | | | |
| Oct. 2 | I and II | 3 | 25.00 | 22.50 | 23.33 | 70.00 | 7 | 20.36 | 142.50 | .08 |
| | Scarred, faulty, etc | 4 | 18.50 | 18.00 | 18.13 | 72.50 | | | | |
| Extra large: | | | | | | | | | | |
| May 22 | I and II | 95 | 25.00 | 25.00 | 25.00 | 2,375.00 | 170 | 22.26 | 3,785.00 | 1.34 |
| | Scarred, faulty, etc | 75 | 19.00 | 18.50 | 18.80 | 1,410.00 | | | | |
| Oct. 2 | I and II | 68 | 26.00 | 22.50 | 25.74 | 1,750.00 | 151 | 21.46 | 3,241.00 | 1.77 |
| | Scarred, faulty, etc | 80 | 18.50 | 18.00 | 18.45 | 1,476.00 | | | | |
| | III | 3 | 5.00 | 5.00 | 5.00 | 15.00 | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Large: | | | | | | | | | | |
| May 22 | I and II | 1,715 | 25.00 | 19.50 | 22.02 | 37,765.00 | 2,932 | 20.15 | 59,089.50 | 23.05 |
| | Scarred, faulty, etc | 1,195 | 18.50 | 17.50 | 17.76 | 21,220.00 | | | | |
| | III | 22 | 4.75 | 4.75 | 4.75 | 104.50 | | | | |
| Oct. 2 | I and II | 1,197 | 25.00 | 21.50 | 23.44 | 28,059.50 | 2,115 | 21.34 | 45,128.00 | 24.84 |
| | Scarred, faulty, etc | 883 | 19.75 | 18.00 | 19.01 | 16,783.50 | | | | |
| | III | 35 | 10.00 | 5.00 | 8.14 | 285.00 | | | | |
| Medium: | | | | | | | | | | |
| May 22 | I and II | 4,630 | 20.25 | 17.00 | 18.12 | 83,877.50 | 8,007 | 16.68 | 133,575.75 | 62.95 |
| | Scarred, faulty, etc | 3,320 | 16.50 | 14.00 | 14.89 | 49,427.50 | | | | |
| | III | 57 | 4.75 | 4.75 | 4.75 | 270.75 | | | | |
| Oct. 2 | I and II | 3,093 | 23.50 | 21.00 | 22.10 | 68,356.00 | 5,492 | 19.98 | 109,737.00 | 64.49 |
| | Scarred, faulty, etc | 2,316 | 18.25 | 17.00 | 17.61 | 40,776.00 | | | | |
| | III | 83 | 10.00 | 5.00 | 7.29 | 605.00 | | | | |
| Small medium: | | | | | | | | | | |
| May 22 | I and II | 830 | 17.00 | 14.50 | 15.16 | 12,580.00 | 1,611 | 13.71 | 22,089.75 | 12.66 |
| | Scarred, faulty, etc | 760 | 12.75 | 12.00 | 12.38 | 9,410.00 | | | | |
| | III | 21 | 4.75 | 4.75 | 4.75 | 99.75 | | | | |
| Oct. 2 | I and II | 391 | 18.50 | 17.00 | 17.60 | 6,882.50 | 750 | 15.70 | 11,778.50 | 8.81 |
| | Scarred, faulty, etc | 328 | 14.50 | 14.00 | 14.23 | 4,666.00 | | | | |
| | III | 31 | 10.00 | 5.00 | 7.42 | 230.00 | | | | |
| All classes: | | | | | | | | | | |
| May 22 | | | | | | | 12,720 | 17.18 | 218,540.00 | 100.00 |
| Oct. 2 | | | | | | | 8,516 | 19.97 | 170,049.50 | 100.00 |
| DYED MATARA BROWN | | | | | | | | | | |
| Large: | | | | | | | | | | |
| Oct. 2 | I and II | 585 | 43.00 | 31.75 | 35.85 | 20,972.50 | 870 | 32.74 | 28,483.75 | 17.06 |
| | Scarred, faulty, etc | 285 | 28.25 | 25.50 | 26.36 | 7,511.25 | | | | |
| Medium: | | | | | | | | | | |
| Oct. 2 | I and II | 2,380 | 35.00 | 27.50 | 31.31 | 74,522.50 | 3,565 | 28.48 | 101,535.00 | 69.90 |
| | Scarred, faulty, etc | 1,185 | 24.50 | 21.00 | 22.80 | 27,012.50 | | | | |
| Small medium: | | | | | | | | | | |
| Oct. 2 | I and II | 400 | 25.50 | 22.00 | 23.39 | 9,357.50 | 665 | 20.71 | 13,773.75 | 13.04 |
| | Scarred, faulty, etc | 265 | 18.50 | 14.50 | 16.67 | 4,416.25 | | | | |
| All classes: | | | | | | | | | | |
| Oct. 2 | | | | | | | 5,100 | 28.19 | 143,792.50 | 100.00 |
| MISCELLANEOUS | | | | | | | | | | |
| Oct. 2 | Unhaired and dressed | 44 | .50 | .50 | .50 | 22.00 | 118 | .34 | 40.50 | 100.00 |
| | Raw | 74 | .25 | .25 | .25 | 18.50 | | | | |

*Special sales of Pribilof Islands fur-seal skins in 1939*

| Date | Number of skins | Description | Price per skin | Total |
|---|---|---|---|---|
| Jan. 30 | 20 | Dyed black, medium | $22.18 | $443.60 |
| Feb. 28 | 20 | do | 22.18 | 443.60 |
| | 40 | Dyed safari brown, medium | 21.63 | 865.20 |
| Mar. 30 | 2 | Dyed safari brown, large | 25.57 | 51.14 |
| | 2 | Dyed safari brown, medium | 21.63 | 43.26 |
| | 1 | Dyed black, medium | 22.18 | 22.18 |
| Apr. 30 | 12 | Dyed black, large | 25.51 | 306.12 |
| May 17 | 50 | Raw | 10.73 | 536.50 |
| June 19 | 35 | Dyed black, large | 22.09 | 773.15 |
| | 35 | Dyed safari brown, large | 22.02 | 770.70 |
| | 40 | Dyed black, medium | 17.39 | 695.60 |
| | 80 | Dyed safari brown, medium | 18.12 | 1,449.60 |
| June 26 | 23 | Raw | 10.73 | 246.79 |
| July 11 | 80 | Dyed black, medium | 17.39 | 1,391.20 |
| Aug. 15 | 35 | Dyed black, large | 22.09 | 773.15 |
| | 40 | Dyed black, medium | 17.39 | 695.60 |
| | 40 | Dyed safari brown, medium | 18.12 | 724.80 |
| Aug. 30 | 22 | Raw | 10.73 | 236.06 |
| Sept. 30 | 35 | Dyed safari brown, large | 22.02 | 770.70 |
| Oct. 30 | 40 | Dyed matara brown, medium | 31.31 | 1,252.40 |
| | 35 | Dyed matara brown, large | 35.85 | 1,254.75 |
| | 40 | Dyed black, medium | 19.21 | 768.40 |
| Nov. 30 | 40 | Dyed matara brown, medium | 31.31 | 1,252.40 |
| Dec. 30 | 20 | Dyed safari brown, medium | 22.10 | 442.00 |
| | 787 | | | 16,208.90 |

## DISPOSITION OF FUR-SEAL SKINS TAKEN ON PRIBILOF ISLANDS

On January 1, 1939, there were on hand 72,876 fur-seal skins taken on the Pribilof Islands. Of these, 72,858 were at St. Louis, Mo., and 18 at Washington. In 1939, 60,473 fur-seal skins were taken on the Pribilof Islands and shipped to St. Louis. Of the skins on hand at the beginning of the year, 43,086 were disposed of, leaving 29,790 unsold, which, with the 60,473 taken in 1939, make a total of 90,263 on hand on December 31, 1939. The following tables show further details with regard to fur-seal skins taken on the Pribilof Islands, as well as details concerning other fur-seal skins under the control of the Department of the Interior:

*Summary of all Government-owned fur-seal skins under control of Department of the Interior, calendar year 1939*

| Source | On hand Jan. 1 | | | Receipts in 1939 | Sales in 1939 | Used for tests | On hand Dec. 31 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Fouke Fur Co. | Washington office | Total | | | | Fouke Fur Co. | Washington office | Total |
| Taken on Pribilof Islands: | | | | | | | | | |
| Calendar year 1918, held for reference purposes | | 7 | 7 | | | | | 7 | 7 |
| Calendar year 1923 | | 3 | 3 | | | | | 3 | 3 |
| Calendar year 1924 | | 1 | 1 | | | | | 1 | 1 |
| Calendar year 1929 | | 5 | 5 | | | | | 5 | 5 |
| Calendar year 1930 | | 2 | 2 | | | | | 2 | 2 |
| Calendar year 1936 | 5 | | 5 | | 5 | | | | |
| Calendar year 1937 | 23,244 | | 23,244 | | 23,234 | | 10 | | 10 |
| Calendar year 1938 | 49,609 | | 49,609 | | 19,832 | 15 | 29,743 | [1] 19 | 29,762 |
| Calendar year 1939 | | | | [2] 60,473 | | | 60,473 | | 60,473 |
| Miscellaneous skins held for reference purposes | | 4 | 4 | | | | | 4 | 4 |
| United States' share of Japanese sealskins: | | | | | | | | | |
| Season of 1937 | 210 | | 210 | | 210 | | | | |
| Season of 1938 | | | | 210 | | | 210 | | 210 |
| Total | 73,068 | 22 | 73,090 | 60,683 | 43,281 | 15 | 90,436 | 41 | 90,477 |

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[1] Being held as standard samples in custody of the U. S. Bureau of Standards.

[2] Includes the Canadian share of sealskins which were in custody of the Fouke Fur Co. and which the Canadian Government subsequently authorized to be handled with skins of the United States.

*Summary of Government-owned fur-seal skins in the custody of Fouke Fur Co., at St. Louis, Mo., calendar year 1939*

| Source | On hand Jan. 1 | Receipts in 1939 | Disposed of in 1939 | On hand Dec. 31 |
|---|---|---|---|---|
| Taken on Pribilof Islands: | | | | |
| Calendar year 1936 | 5 | | 5 | |
| Calendar year 1937 | 23,244 | | 23,234 | 10 |
| Calendar year 1938 | 49,609 | | [1] 19,866 | 29,743 |
| Calendar year 1939 | | [2] 60,473 | | 60,473 |
| United States' share of Japanese fur-seal skins: | | | | |
| Season of 1937 | 210 | | 210 | |
| Season of 1938 | | 210 | | 210 |
| Total | 73,068 | 60,683 | 43,315 | 90,436 |

[1] Of these 19,832 were sold; 15 were used by the U. S. Bureau of Standards in making tests; 19 were shipped to Washington.

[2] Includes the Canadian share of sealskins which were in custody of the Fouke Fur Co. and which the Canadian Government subsequently authorized to be handled with skins of the United States, appropriate distribution to be made of the net proceeds of sales.

## SHIPMENT AND SALE OF FOX SKINS

The 219 blue and 5 white fox skins taken on St. Paul Island and the 799 blue and 6 white fox skins taken on St. George Island in the season of 1938–39 were shipped from the islands on the *Penguin*, sailing on March 18. The vessel reached Seattle on March 31, and the fox skins were forwarded by express to the Department's selling agents at St. Louis, Mo.

At the public auction sale in St. Louis on May 22, 1939, 424 blue fox skins of the 1937–38 season's take were sold for $6,157.50, an average of $14.52 per skin. The maximum price was $46, obtained for one fine silvery pelt sold singly, and for each of 2 No. I light silvery pelts sold in another lot.

On October 2, 1939, there were sold at public auction at St. Louis 512 blue and 11 white fox skins taken on the Pribilof Islands in the 1938–39 season. The blue pelts brought $8,546, an average price of $16.69; and the white pelts brought $143, or $13 each. The maximum price per skin was $62, obtained for 2 No. I silvery pelts.

## FUR-SEAL PATROL

### United States Coast Guard

Vessels of the Coast Guard were again assigned by the Treasury Department to patrol waters along the route of the Alaska fur seals during their northward migration to the Pribilof Islands. Ten cutters and patrol vessels were instrumental in enforcing the laws and regulations for the protection of fur seals and sea otters in the North Pacific and Bering Sea.

On March 15 the cutter *Onondaga* began the regular seal patrol of the Oregon and Washington coasts from Yaquina Head northward to the Strait of Juan de Fuca. A preliminary cruise had been made by this vessel off Columbia River prior to March 15, during which 5 seals were sighted. Many small boats were boarded at sea during the patrol but no evidence of pelagic sealing was found. The seal patrol activities of the *Onondaga* were continued until its return to Astoria on April 1. During the same period the patrol boat *Atalanta* operated out of Neah Bay, patrolling the Strait of Juan de Fuca and western coast of Washington and Vancouver Island from Destruction Island northward to Nootka Sound. The foregoing vessels cruised 1,820 miles and 1,981 miles, respectively, during this patrol.

The cutter *Ingham* departed from the Puget Sound Navy Yard on April 4 to patrol the Strait of Juan de Fuca and waters off the west coasts of Vancouver Island and British Columbia to Dixon Entrance, and returned to the Navy Yard on April 20, having cruised 3,889 miles. The cutter *Haida* made a round trip from Juneau to Kodiak Island in the fur-seal patrol from April 20–29, during which it cruised 1,985 miles.

Seven vessels of the Coast Guard which were assigned to the regular Bering Sea patrol participated in the seal patrol in that region, as well as during their journey north as occasion arose. These included the *Atalanta*, which had engaged in the seal patrol in the spring off the Northwest Coast, and which sailed from Seattle on June 20 for Unalaska for patrol in Bristol Bay waters until September 13. The patrol boat *Hermes* left San Pedro on April 14 for a cruise northward into Bristol Bay, via the Inside Passage, and returned to San Pedro on July 7. The cutter *Duane* sailed from Oakland on April 17 and patrolled North Pacific waters and Bristol Bay until it was relieved at Dutch Harbor on July 20. The patrol boat *Morris* was on this special patrol from the time of its departure from Seattle on May 20 for Unalaska, via the Inside Passage, until its return to Seward on June 22. The cutter *Itasca* sailed from San Diego on May 25 direct for Unalaska, and patrolled in Bering Sea, Norton Sound, and westward to Attu, calling also at Nome and St. Lawrence Island, until it was relieved at Dutch Harbor on September 14. The patrol boat *Alert* left Ketchikan on July 1 for Port Moller and Bering Sea and was relieved at Unalaska on September 9. Superseding the *Northland*, the cutter *Spencer* made the annual cruise to the Arctic Ocean, sailing from Seattle on July 25 and patrolling in Bering Sea and adjacent waters until it was relieved at Dutch Harbor on September 5.

### Bureau of Fisheries

The Bureau of Fisheries vessel *Scoter* was assigned to patrol the waters off the coast of Washington, principally in the vicinity of Neah Bay, during the period of sealing operations by the native Indians. The *Scoter* left Seattle for this duty on April 5 and returned there on April 30.

Warden J. Steele Culbertson was detailed for a short time in April to make a general investigation of sealing operations carried on by various Indian tribes on the Olympic Peninsula. Particular attention was given to the matter of assuring compliance with treaty provisions and the law giving effect thereto concerning the prohibition of the use of firearms or motorboats in the taking of fur seals by the aborigines.

### SEALING PRIVILEGES ACCORDED ABORIGINES

Under the terms of the pelagic sealing treaty of July 7, 1911, Indians and other aborigines dwelling on the coasts of North America are privileged to hunt fur seals by primitive methods. In 1939 there were taken and duly authenticated, by officials of the respective Governments, 637 fur-seal skins, of which 61 were taken by Indians under the jurisdiction of the United States and 576 by Indians of Canada. The details are as follows:

*Washington.*—Thirty sealskins, all from female seals, were taken off the coast of Washington by Indians of Neah Bay and La Push during the months of February to May, inclusive. The skins were authenticated by N. O. Nicholson, superintendent of the Taholah Indian Agency at Hoquiam, Wash., and by Warden J. Steele Culbertson, who was detailed to assist in the fur-seal patrol for a short time during April.

*Alaska.*—Thirty-one sealskins were taken by the natives of Sitka during April and May, and were authenticated by Bureau employees. Of these skins, 1 was from a male and 30 were from female seals.

*British Columbia.*—Indians along the British Columbia coast took 576 fur-seal skins in 1939, according to an official report.

### JAPANESE SEALSKINS DELIVERED TO THE UNITED STATES

In accordance with provisions of the fur-seal treaty of 1911, there were allotted to the United States 210 Japanese fur-seal skins, or 10 percent of the number taken by Japan on Robben Island in 1939. These skins were received by the Department's selling agents at St. Louis, Mo., on May 3, 1940.

### SUBSTATION FOR SEA-OTTER PATROL

Two wardens were employed to carry on sea-otter investigations and patrol at the Amchitka substation in the summer of 1939, and for the first time the work was continued throughout the winter. The men and supplies were transported by the *Penguin*, sailing from St. Paul Island on July 2 and arriving at Amchitka Island on July 10. Before the vessel's departure on the return trip on July 12, the crew of the *Penguin* assisted in getting the station in readiness, the work performed consisting of repairs to electric wiring, rigging radio antennae, installing radio-telephone transmitter, and checking over the Diesel power plant.

Careful surveys were made of sea otters in the vicinity of the island, and the number counted showed a fair increase over the preceding year. No evidence of poaching was observed. Special attention was given to verifying statements of Atka natives that many sea otters had been found washed up on the beach during the winter of 1938–39, but only 3 sea-otter skeletons were discovered, indicating that the mortality had not been abnormally high.

## COMPUTATION OF FUR SEALS, PRIBILOF ISLANDS, 1939

By Harry J. Christoffers

The commercial killing of 3-year-old male seals at the Pribilof Islands in 1939 showed a considerable increase, indicating that sufficient males had been reserved in the past for breeding requirements.

In all, 56,520 3-year-old males were killed in 1939, as compared with 54,140 in 1938 and 54,890 in 1935. Not only was this season's take the largest since the treaty of 1911, but operations were confined to a shorter period than in some years, commercial sealing having been discontinued on July 26, as against August 1 in 1938 and July 31 in

1935. Considering the rate at which 3-year-old seals were arriving when killings were discontinued in 1939, it is believed that more than 5,000 additional seals could have been taken if killings had been continued through the month of July. The larger reserve of 3-year-old males should help considerably in reducing the average harem when these animals are able to take their stations on the rookeries as harem bulls.

Peculiar conditions prevailed throughout the entire sealing season. In spite of the large average harem, large numbers of capable harem bulls continued to remain on the hauling grounds throughout the entire killing period and there were numerous strong bulls at the end of the season which had no doubt taken their positions after the earlier-arriving harem bulls had retired.

Though harems were pretty well broken up for a number of days before sealing was discontinued, there were comparatively few cows and very few 2-year-olds or yearlings in the drives.

For comparative purposes preliminary harem counts were made on the various rookeries throughout the season, and some very interesting results are shown. On June 27 Mr. Johnston counted 125 harems on East rookery, St. George Island, but on July 21 he found only 102 harems there. Under normal circumstances it would be safe to predict an increase in harem bulls of at least 75 percent during the period stated. On July 8 Mr. Johnston counted 78 harems on Zapadni Reef, St. Paul Island, but on July 18 there were only 76 harems.

No branded bulls were observed on any rookery this season. The albino bull first noted in 1935 was seen in two of the earlier Reef drives this season and then disappeared. Mr. Johnston observed an albino pup on Zapadni rookery, St. George Island.

## BULLS

As in previous years, a census was taken of harem and idle bulls. The census on St. Paul Island was taken jointly by the Superintendent and by Edward C. Johnston, who conducted the census each year from 1921 to 1927, inclusive. The census on St. George Island was taken by Mr. Johnston alone.

The published census of harem and idle bulls for 1938 stated that "there is a possibility of a shortage of bulls within the next few years," and also that "it would be advisable each year to make an additional reserve of males."

The census of harem bulls for 1939 showed a much larger average harem than usual, a condition which cannot be entirely accounted for, as there were numerous capable harem-size bulls in the drives and among the idle-bull class throughout the entire season. It is hard to understand why all these bulls did not take up permanent positions and secure harems.

The sharp reduction in the total number of harem bulls may possibly be due in part to the fact that in recent years killings were continued until the close of July, with no additional reserve of 3-year-olds being made throughout the killing season. This, however, should not have any particular bearing on the present situation, for in 1931 a total of 5,226 seals were reserved before August 1, and in 1932 2,244 were reserved before that date. The seals reserved in 1931 and 1932 would be 11 and 10 years old, respectively, this year, and should have been in their prime.

It should also be noted that from 1930 to 1934 there was an average harem ranging from 38.39 to 41.95, the lowest average harems known for any period since special additional reserves of seals were made in 1923. In spite of these low average harems there was no marked increase in the number of 3-year-olds available for killing in succeeding years. Theoretically, when the average harems were smallest, as in 1931 and 1932, a greater percentage of females should have been bred than when there was a larger average harem. However, when the progeny of the low-average harems became of killable age, no proportionately greater increase was noticeable in the number of 3-year-olds available. There has been a gradual increase in the average harem from 38.39 in 1933 to 46.69 in 1938 and 60.44 in 1939. Nevertheless, it is still believed that there should be a considerable surplus of breeding males and that under normal conditions the larger the surplus of breeding males the faster the herd will increase.

In 1938 there was a conspicuous shortage of idle bulls on the rookeries and hauling grounds. In 1939 this condition was reversed. There was an abundance of large, vigorous bulls on the hauling grounds. Why they remained there throughout the season when the harem areas contained considerably less than the usual number of bulls is not known.

Because of this sharp reduction in the number of harem bulls, it appeared advisable to start creating a much larger reserve of 3-year-old males. Commercial sealing, therefore, was discontinued on July 26. This provision for an additional reserve should be continued for a number of years and, if conditions warrant, it would be desirable to make an even larger reserve than was made this year.

The desirability of having the harem and idle bull count made by the same persons in the same way each year was clearly shown this season. Counts of the larger rookeries cannot be made accurately, but if the same enumerators use the same methods each season the possibility of any wide variation in estimates will be reduced to a minimum. With plenty of idle bulls on the hauling grounds this season, it would normally have been expected that killings could safely be continued until the end of July, but the sharp increase in the size of the average harem appeared as a warning to leave a larger male reserve.

Too close killing for a year or two should not result in any considerable harm, as mature males should be capable of doing harem duty from 6 to 8 years.

No harem count was made on Sivutch rookery, but on account of the reduced number of harems on most of the other rookeries a reduction was applied also to this rookery.

Owing to lack of suitable space, some of the rookeries are incapable of continuous enlargement. As the 8 percent increase of cows must still be applied in order to determine the total increase of the herd, the resulting average harem for these rookeries is shown as considerably larger than it should be. Only the average harem for the entire herd, therefore, should receive consideration.

Except when the Polovina count was made, unusually good weather for counting prevailed during the entire period in which harem counts and estimates were made. Presumably it is generally understood that only the smaller rookeries can be accurately counted. Estimates are essential for portions of all large rookeries.

*Estimated number of harem and idle bulls, approximate ratio of idle bulls to harem bulls, and average harem, 1939*

| Rookery | Date | Harem bulls | Idle bulls | Total | Approximate ratio of idle bulls to harem bulls | Average harem |
|---|---|---|---|---|---|---|
| St. Paul Island: | | | | | | |
| Kitovi | July 16 | 458 | 79 | 537 | 1:6 | 47.94 |
| Lukanin | do | 166 | 38 | 204 | 1:4 | 63.95 |
| Gorbatch | July 15 | 900 | 550 | 1,450 | 1:2 | 61.94 |
| Ardiguen | do | 103 | 20 | 123 | 1:5 | 51.20 |
| Reef | do | 1,600 | 485 | 2,085 | 1:3 | 69.99 |
| Sivutch | do | 400 | 65 | 465 | 1:6 | 85.67 |
| Lagoon | July 18 | 1 | | 1 | | 32.00 |
| Tolstoi | July 15 | 975 | 192 | 1,167 | 1:5 | 67.61 |
| Zapadni | July 18 | 786 | 250 | 1,036 | 1:3 | 80.60 |
| Little Zapadni | do | 482 | 118 | 600 | 1:4 | 67.00 |
| Zapadni Reef | do | 76 | 19 | 95 | 1:4 | 14.74 |
| Polovina | July 16 | 420 | 151 | 571 | 1:3 | 54.21 |
| Polovina Cliffs | do | 355 | 141 | 496 | 1:3 | 35.12 |
| Little Polovina | do | 165 | 66 | 231 | 1:3 | 27.51 |
| Morjovi | July 17 | 435 | 181 | 616 | 1:2 | 18.76 |
| Vostochni | do | 1,800 | 261 | 2,061 | 1:7 | 50.47 |
| Total | | 9,122 | 2,616 | 11,738 | 1:3 | 59.34 |
| St. George Island: | | | | | | |
| North | July 21 | 640 | 77 | 717 | 1:8 | 69.03 |
| Staraya Artil | July 20 | 534 | 68 | 602 | 1:9 | 62.34 |
| Zapadni | July 22 | 212 | 72 | 284 | 1:3 | 22.16 |
| South | do | 139 | 10 | 149 | 1:14 | 7.94 |
| East Reef | July 21 | 102 | 50 | 152 | 1:2 | 99.24 |
| East Cliffs | do | 231 | 80 | 311 | 1:3 | 125.13 |
| Total | | 1,858 | 357 | 2,215 | 1:5 | 65.82 |
| Total (both islands) | | 10,980 | 2,973 | 13,953 | 1:4 | 60.44 |

## AVERAGE HAREM

The average harem computed for 1939 was 60.44, compared with 46.69 in 1938. This estimate is based on an average increase for cows of 8 percent. It has been felt for a number of years that an 8 percent increase may be somewhat too high, and, if this is true, the actual average harem would be somewhat smaller than computed.

The great increase in the average harem this year might indicate, if there is no change another season, that killings have been rather close. This may not necessarily be true, however, as the proportion of 3-year-olds remaining during the years from which present harem and idle bulls were recruited should have been more than sufficient, under normal circumstances, to provide enough bulls for a smaller average harem. Sometime during the life cycle of these animals there must have been a larger percentage of deaths than normal. It may be that as the herd increases, some unknown factor causes an increased death rate of all animals. These unknown factors will tend to make it considerably harder, as the herd increases, to figure what percentage of males it will be necessary to leave for breeding purposes.

*Computation of breeding cows, based on annual increase of 8 percent, and of average harem, in 1939*

| Rookery | Breeding cows | | Harem bulls, 1939 | Average harem | | |
|---|---|---|---|---|---|---|
| | 1938 | 1939 | | 1938 | 1939 | Increase (+) or decrease (−) in 1939 from 1938 |
| St. Paul Island: | | | | | | |
| Kitovi | 20,330 | 21,956 | 458 | 49.11 | 47.94 | −1.17 |
| Lukanin | 9,829 | 10,615 | 166 | 53.71 | 63.95 | +10.24 |
| Gorbatch | 51,620 | 55,750 | 900 | 49.16 | 61.94 | +12.78 |
| Ardiguen | 4,883 | 5,274 | 103 | 50.86 | 51.20 | +.34 |
| Reef | 103,688 | 111,983 | 1,600 | 49.38 | 69.99 | +20.61 |
| Sivutch | 31,729 | 34,267 | 400 | 66.80 | 85.67 | +18.87 |
| Lagoon (actual count pups) | 53 | 32 | 1 | 26.50 | 32.00 | +5.50 |
| Tolstoi | 61,037 | 65,920 | 975 | 50.86 | 67.61 | +16.75 |
| Zapadni | 58,659 | 63,352 | 786 | 58.66 | 80.60 | +21.94 |
| Little Zapadni | 29,901 | 32,293 | 482 | 51.91 | 67.00 | +15.09 |
| Zapadni Reef | 1,037 | 1,120 | 76 | 15.03 | 14.74 | −.29 |
| Polovina | 21,082 | 22,769 | 420 | 45.44 | 54.21 | +8.77 |
| Polovina Cliffs | 11,543 | 12,466 | 355 | 31.28 | 35.12 | +3.84 |
| Little Polovina | 4,203 | 4,539 | 165 | 35.03 | 27.51 | −7.52 |
| Morjovi | 7,556 | 8,160 | 435 | 25.02 | 18.76 | −6.26 |
| Vostochni | 84,114 | 90,843 | 1,800 | 36.57 | 50.47 | +13.90 |
| Total | 501,264 | 541,339 | 9,122 | 46.76 | 59.34 | +12.58 |
| St. George Island: | | | | | | |
| North | 40,907 | 44,180 | 640 | 51.13 | 69.03 | +17.90 |
| Staraya Artil | 30,822 | 33,288 | 534 | 47.42 | 62.34 | +14.92 |
| Zapadni | 4,349 | 4,697 | 212 | 18.91 | 22.16 | +3.25 |
| South | 1,021 | 1,103 | 139 | 6.81 | 7.94 | +1.13 |
| East Reef | 9,373 | 10,123 | 102 | 50.66 | 99.24 | +48.58 |
| East Cliffs | 26,763 | 28,904 | 231 | 62.97 | 125.13 | +62.16 |
| Total | 113,235 | 122,295 | 1,858 | 46.41 | 65.82 | +19.41 |
| Total (both islands) | 614,499 | 663,634 | 10,980 | 46.69 | 60.44 | +13.75 |

## PUPS AND COWS

The estimated number of pups and cows is determined by applying an increase of 8 percent to the number computed for the previous season.

It is now believed that the estimated rate of increase is slightly too high. The killings of 3-year-old males during the past few years have indicated that the applied percentage of increase was somewhat too high, but, on the other hand, it may be that a larger death rate should be applied for a portion or all of the first 3 years of the life cycle. The final results would be the same. One hesitates about making changes until observations make it entirely essential. The increase in killable animals this season might indicate the beginning of another cycle wherein there may be a smaller mortality rate than has been apparent for the past few years.

There did not appear to be any increase in the percentage of dead pups, and the percentage determined in 1922 has therefore been applied to each rookery. The estimated number of dead pups has been included, as usual, in the total number of pups for comparative purposes. Inasmuch as the estimated number of dead pups has now reached a grand total of 11,333, and has been around the 10,000 mark for several years, it is quite evident that total census figures are somewhat higher than they should be, even though the discrepancy is proportionately no greater than it has been in the past.

*Distribution of pups on the Pribilof Islands, Aug. 10, 1939, and comparison with distribution in 1938*

| Rookery | 1939 | | | | Total pups, 1938 | Increase, 1939 |
|---|---|---|---|---|---|---|
| | Living pups | Dead pups | Total pups | Percent dead pups | | |
| St. Paul Island: | | | | | | |
| Kitovi | 21, 633 | 323 | 21, 956 | 1. 47 | 20, 330 | 1, 626 |
| Lukanin | 10, 385 | 230 | 10, 615 | 2. 17 | 9, 829 | 786 |
| Gorbatch | 55, 271 | 479 | 55, 750 | . 86 | 51, 620 | 4, 130 |
| Ardiguen | 5, 148 | 126 | 5, 274 | 2. 39 | 4, 883 | 391 |
| Reef | 110, 348 | 1, 635 | 111, 983 | 1. 46 | 103, 688 | 8, 295 |
| Sivutch | 33, 431 | 836 | 34, 267 | 2. 44 | 31, 729 | 2, 538 |
| Lagoon (actual count) | 32 | | 32 | | 53 | −21 |
| Tolstoi | 65, 004 | 916 | 65, 920 | 1. 39 | 61, 037 | 4, 883 |
| Zapadni | 62, 262 | 1, 090 | 63, 352 | 1. 72 | 53, 659 | 4, 693 |
| Little Zapadni | 31, 486 | 807 | 32, 293 | 2. 50 | 29, 901 | 2, 392 |
| Zapadni Reef | 1, 111 | 9 | 1, 120 | . 80 | 1, 037 | 83 |
| Polovina | 22, 421 | 348 | 22, 769 | 1. 53 | 21, 082 | 1, 687 |
| Polovina Cliffs | 12, 235 | 231 | 12, 466 | 1. 85 | 11, 543 | 923 |
| Little Polovina | 4, 425 | 114 | 4, 539 | 2. 51 | 4, 203 | 336 |
| Morjovi | 7, 995 | 165 | 8, 160 | 2. 02 | 7, 556 | 604 |
| Vostochni | 88, 953 | 1, 890 | 90, 843 | 2. 08 | 84, 114 | 6, 729 |
| Total | 532, 140 | 9, 199 | 541, 339 | 1. 70 | 501, 264 | 40, 075 |
| St. George Island: | | | | | | |
| North | 43, 561 | 619 | 44, 180 | 1. 40 | 40, 907 | 3, 273 |
| Staraya Artil | 32, 429 | 859 | 33, 288 | 2. 58 | 30, 822 | 2, 466 |
| Zapadni | 4, 644 | 53 | 4, 697 | 1. 12 | 4, 349 | 348 |
| South | 1, 084 | 19 | 1, 103 | 1. 72 | 1, 021 | 82 |
| East Reef | 9, 970 | 153 | 10, 123 | 1. 51 | 9, 373 | 750 |
| East Cliffs | 28, 473 | 431 | 28, 904 | 1. 49 | 26, 763 | 2, 141 |
| Total | 120, 161 | 2, 134 | 122, 295 | 1. 74 | 113, 235 | 9, 060 |
| Total (both islands) | 652, 301 | 11, 333 | 663, 634 | 1. 71 | 614, 499 | 49, 135 |

## MORTALITY OF SEALS AT SEA

The number of killable 3-year-old male seals arriving at the islands this season indicated that it would not be desirable this year to change the mortality rates for any of the age classes. The sharp decrease in the number of harem bulls makes it appear that possibly there was a considerably greater mortality among the seals during one or several years of the life cycle of the males which should now be in the breeding bull classes. This increased death rate, if such there were, may now be leveled off by a correspondingly smaller death rate for the present and following 3-year-old classes.

Continually changing conditions at sea, causing a considerable increase or decrease in the death rate from year to year, make it entirely impossible to establish a constant mortality rate. Continuous abnormal conditions make it possible to know only after a number of years have elapsed whether mortality rates have been incorrect for a given period.

## COMPLETE COMPUTATION

The following summary shows the methods used in computing the number of animals in the fur-seal herd of the Pribilof Islands in 1939. The total number of seals of all classes as of August 10, 1939, was 2,020,774, or 148,336 more than in 1938. This gives an increase for the herd of 7.92 percent.

*Complete computation of fur seals, Pribilof Islands, as of August 10, 1939*

| Class | St. Paul Island | St. George Island | Total |
|---|---|---|---|
| Pups, estimated | 541, 339 | 122, 295 | 663, 634 |
| Breeding cows, 3 years old and over, by inference | 541, 339 | 122, 295 | 663, 634 |
| Harem bulls, estimated | 9, 122 | 1, 858 | 10, 980 |
| Idle bulls, estimated | 2, 616 | 357 | 2, 973 |
| Yearlings, male and female, estimated: | | | |
| Females born in 1938 | 250, 632 | 56, 618 | 307, 250 |
| Natural mortality, 45 percent | 112, 784 | 25, 478 | 138, 262 |
| Yearling females, Aug. 10, 1939 | 137, 848 | 31, 140 | 168, 988 |
| Males born in 1938 | 250, 632 | 56, 617 | 307, 249 |
| Natural mortality, 50 percent | 125, 316 | 28, 309 | 153, 625 |
| Yearling males beginning 1939 | 125, 316 | 28, 308 | 153, 624 |
| Yearling males killed in 1939 | 3 | | 3 |
| Yearling males, Aug. 10, 1939 | 125, 313 | 28, 308 | 153, 621 |
| 2-year olds, male and female, estimated: | | | |
| Yearling females, Aug. 10, 1938 | 127, 637 | 28, 833 | 156, 470 |
| Natural mortality, 15 percent | 19, 146 | 4, 325 | 23, 471 |
| 2-year-old females, Aug. 10, 1939 | 108, 491 | 24, 508 | 132, 999 |
| Yearling males, Aug. 10, 1938 | 116, 020 | 26, 212 | 142, 232 |
| Natural mortality, 17.5 percent | 20, 304 | 4, 587 | 24, 891 |
| 2-year-old males beginning 1939 | 95, 716 | 21, 625 | 117, 341 |
| 2-year-old males killed in 1939 | 893 | 324 | 1, 217 |
| 2-year-old males, Aug. 10, 1939 | 94, 823 | 21, 301 | 116, 124 |
| 3-year-old males, estimated: | | | |
| 2-year-old males, Aug. 10, 1938 | 87, 205 | 19, 798 | 107, 003 |
| Natural mortality 12.5 percent | 10, 901 | 2, 475 | 13, 376 |
| 3-year-old males beginning 1939 | 76, 304 | 17, 323 | 93, 627 |
| 3-year-old males killed in 1939 | 44, 644 | 11, 876 | 56, 520 |
| 3-year-old males, Aug. 10, 1939 | 31, 660 | 5, 447 | 37, 107 |
| 4-year-old males, estimated: | | | |
| 3-year-old males, Aug. 10, 1938 | 27, 707 | 4, 571 | 32, 278 |
| Natural mortality 10 percent | 2, 771 | 457 | 3, 228 |
| 4-year-old males beginning 1939 | 24, 936 | 4, 114 | 29, 050 |
| 4-year-old males killed in 1939 | 1, 999 | 565 | 2, 564 |
| 4-year-old males, Aug. 10, 1939 | 22, 937 | 3, 549 | 26, 486 |
| 5-year-old males, estimated: | | | |
| 4-year-old males, Aug. 10, 1938 | 20, 637 | 3, 638 | 24, 275 |
| Natural mortality, 10 percent | 2, 064 | 364 | 2, 428 |
| 5-year-old males beginning 1939 | 18, 573 | 3, 274 | 21, 847 |
| 5-year-old males killed in 1939 | 8 | | 8 |
| 5-year-old males, Aug. 10, 1939 | 18, 565 | 3, 274 | 21, 839 |
| 6-year-old males, estimated: | | | |
| 5-year-old males, Aug. 10, 1938 | 14, 317 | 3, 884 | 18, 201 |
| Natural mortality, 20 percent | 2, 863 | 777 | 3, 640 |
| 6-year-old-males, Aug. 10, 1939 | 11, 454 | 3, 107 | 14, 561 |
| Surplus bulls, 7 years old and over, estimated: | | | |
| 6-year-old males, Aug. 10, 1938 | 14, 854 | 2, 415 | 17, 269 |
| Natural mortality, 20 percent | 2, 971 | 483 | 3, 454 |
| 7-year-old males, Aug. 10, 1939 | 11, 883 | 1, 932 | 13, 815 |
| Surplus bulls, Aug. 10, 1938 | (1) | (1) | 7, 277 |
| Natural mortality, 30 percent | | | 2, 183 |
| Remaining surplus for 1939 | | | 5, 094 |

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[1] Estimates have been worked out, insofar as possible, to show approximately the number of seals of each class which should be credited to each island. The seals, however, do not haul out in accordance with figures given. Those born on one island frequent the other island. They travel promiscuously between the two islands and haul out on either one. The total for both islands, however, is approximately correct.

*Complete computation of fur seals, Pribilof Islands, as of August 10, 1939*—Continued

| Class | St. Paul Island | St. George Island | Total |
|---|---|---|---|
| Surplus bulls, 7 years old and over, estimated—Continued. | | | |
| Breeding bulls of 1938 | 12,507 | 2,778 | 15,285 |
| Natural mortality, 30 percent | 3,752 | 833 | 4,585 |
| 1938 bulls remaining in 1939 | 8,755 | 1,945 | 10.700 |
| Breeding bulls of 1939 | 11,738 | 2.215 | 13,953 |
| 1938 bulls remaining deducted | 8,755 | 1,945 | 10.700 |
| Increment of new bulls in 1939 | 2.983 | 270 | 3,253 |
| 7-year-old males computed for 1939 | 11,883 | 1,932 | 13,815 |
| Surplus bulls computed for 1939 | | | 5,094 |
| Total theoretical bull stock for 1939 | | | 18,909 |
| New increment of breeding bulls deducted | | | 3,253 |
| Surplus bulls in 1939 | | | 15,656 |
| 50 percent deducted for losses due to natural causes, and errors in loss percentages in previous years | | | 7,828 |
| Surplus bulls, Aug. 10, 1939 | | | 7,828 |

*Recapitulation*

| Class | Total | Class | Total |
|---|---|---|---|
| Pups | 663,634 | 5-year-old males | 21,839 |
| Cows | 663,634 | 6-year-old males | 14,561 |
| Harem bulls | 10,980 | Surplus bulls | 7,828 |
| Idle bulls | 2,973 | | |
| Yearling females | 168,988 | Total, 1939 | 2,020,774 |
| Yearling males | 153,621 | Total, 1938 | 1,872,438 |
| 2-year-old females | 132.999 | | |
| 2-year-old males | 116,124 | Numerical increase, 1939 | 148,336 |
| 3-year-old males | 37,107 | Percent increase, 1939 | 7.92 |
| 4-year-old males | 26,486 | | |

UNITED STATES DEPARTMENT OF THE INTERIOR
HAROLD L. ICKES, Secretary

BUREAU OF FISHERIES
CHARLES E. JACKSON, Acting Commissioner

Administrative Report No. 41

# FISHERY INDUSTRIES OF THE UNITED STATES

## 1939

By R. H. FIEDLER

APPENDIX III TO REPORT OF COMMISSIONER OF FISHERIES
FOR THE FISCAL YEAR 1940

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1941

For sale by the Superintendent of Documents, Washington, D. C. - - - - Price 35 cents

## ADMINISTRATIVE REPORT SERIES

Since the advent of the Administrative Report Series, considerable confusion has arisen concerning its system of numbering the separates composing it. Inasmuch as the Reports of the Divisions vary in order from year to year, many have found their designations as "Appendix No. I, II, III, or IV" very confusing. To relieve this, it has been decided to number them as "Administrative Report No. —." Inasmuch as 20 separates had already been printed in this series before starting the numbers, it was deemed advisable to begin the numbering with Administrative Report No. 21. Of course, numbers cannot be printed on those already off the press, but for the information of those who wish to know what the first 20 were, they are numbered for filing purposes as follows:

No. 1. Report, Commissioner of Fisheries, 1931.
No. 2. Alaska Fishery and Fur-Seal Industries, 1930.
No. 3. Fishery Industries of the United States, 1930.
No. 4. Progress in Biological Inquiries, 1930.
No. 5. Propagation and Distribution of Food Fishes, 1931.
No. 6. Report, Commissioner of Fisheries, 1932.
No. 7. Alaska Fishery and Fur-Seal Industries, 1931.
No. 8. Fishery Industries of the United States, 1931.
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No. 15. Fishery Industries of the United States, 1933.
No. 16. Alaska Fishery and Fur-Seal Industries, 1933.
No. 17. Progress in Biological Inquiries, 1933.
No. 18. Propagation and Distribution of Food Fishes, 1934.
No. 19. Alaska Fishery and Fur-Seal Industries, 1934.
No. 20. Fishery Industries of the United States, 1934.

Note that the last Commissioner's Report was for 1932. Since then its place has been taken by a reprint from the Report of the Secretary of Commerce under the title "Bureau of Fisheries." Inasmuch as it is no longer a Bureau publication, it is not numbered; but it will be supplied to any who request the Report of the Commissioner for any year since 1932.

# FISHERY INDUSTRIES OF THE UNITED STATES, 1939[1]

By R. H. FIEDLER, *Chief, Division of Fishery Industries*

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## CONTENTS

Page

- Foreword 186

**Part 1.—Operations of the Division**

- Cooperation with other Federal agencies 187
- Cooperation with State agencies 188
- Cooperation with Fishery Advisory Committee 189
- Cooperative Pan-American fishery research 189
  - Technological fishery research 189
  - Statistics 190
- Exhibits at expositions 191
- Economic and marketing investigations 191
  - Fishery cooperative organizations 192
  - Retail marketing of fish and shellfish 195
  - Surplus-fish situation 196
  - Commercial fisheries of the world 197
- Statistical investigations 197
  - Biological aspect 198
  - Economic aspect 198
  - Surveys conducted 198
- Fishery Market News Service 199
  - Field offices 200
    - New York, N. Y 201
    - Boston, Mass 203
    - Chicago, Ill 204
    - Seattle, Wash 205
    - Jacksonville, Fla 206
    - New Orleans, La 207
- Technological investigations 209
  - Laboratories 210
    - College Park, Md 210
    - Seattle, Wash 211
    - Ketchikan, Alaska 211
    - Mayaguez, Puerto Rico 211
  - Preservation of fishery products for food 212
    - Preparation of crab meat 212
      - Sanitary code for the preparation of crab meat 213
    - Preparation of fresh oysters 216
    - Handling of fresh fish aboard fishing vessels and at packing plants 217
    - Ultraviolet rays in killing bacteria 218
    - Preparation and packaging of fresh fish 219
    - Freezing packaged salmon and flounders for subsequent storage in refrigerated lockers 220
    - Composition of commercial species of fish taken on the Pacific coast 221
    - Canning aquatic products 221
    - Development of tests for determining the quality of fish 222
      - Formation of lactic acid and action of enzymes as indices of relative freshness of frozen fish 222
      - Tests for measuring deterioration of fresh salmon 223
      - Identification of canned salmon 223
      - Changes in the composition of pink salmon (*Oncorhynchus gorbuscha*) 224
      - Peroxide test as a measure of oxidative deterioration of fish oil 224
    - Treatments to retard deterioration of fishery products 225
      - Antioxidants 225
      - Chemical preservatives 226
  - Manufacture of fishery byproducts 226
    - Utilization of salmon cannery trimmings 226
    - Utilization of fish livers and visceral organs 227
    - Preparation of fish meals of improved nutritive value 227
    - Storage of fish meal 228
    - Oxidation of fat in fish meal 228
    - Solubility of fish proteins 229
  - Nutritive value of aquatic products 229
    - Nutritive value of proteins of certain shellfish 229
    - Nutritive value of alginates from kelp 229
    - Kelp meal in animal feeding 230

Page

- Technological investigations—Continued.
  - Nutritive value of aquatic products—Con.
    - Possible toxic properties of certain fish meals 230
    - Fluorine in fishery products 231
  - Research associates and student assistants 231
    - Cooperation with Governments of Denmark and Iceland 232
- Educational and consulting service 232
- Publications of the Division 233
  - Documents, reports, and circulars 234
  - Special articles and addresses 234
  - Statistical bulletins 236

**Part 2.—Fishery Statistics, 1938**

- General review 237
- Manufactured fishery products 252
- Canned fishery products and byproducts trade 257
- Frozen fish trade 268
  - Fish, frozen 268
  - Holdings 271
- Cold-storage holdings of cured fish 274
- Foreign fishery trade 275
- Fisheries of the New England States 279
  - Maine 288
  - New Hampshire 294
  - Massachusetts 294
  - Rhode Island 302
  - Connecticut 307
  - Vessel fisheries at principal New England ports 312
    - Economic aspect 312
    - Biological aspect 320
  - Sales of fishery products through the New England Fish Exchange, Boston, Mass. 335
  - Vessel landings of fishery products at New Bedford Mass 344
  - Mackerel fishery of the Atlantic Coast 347
- Fisheries of the Middle Atlantic States 350
  - New York 357
  - New Jersey 367
  - Pennsylvania 378
  - Delaware 378
  - Receipts of fishery products at New York 382
  - Shad fishery of the Hudson River 392
- Fisheries of the Chesapeake Bay States 393
  - Maryland 398
  - Virginia 404
  - Shad and alewife fisheries of the Potomac River 416
  - Trade in fishery products in Washington, D. C 417
- Fisheries of the South Atlantic and Gulf States 418
  - North Carolina 427
  - South Carolina 437
  - Georgia 440
  - Florida 444
  - Alabama 461
  - Mississippi 464
  - Louisiana 467
  - Texas 471
- Fisheries of the Pacific Coast States 475
  - Washington 482
  - Oregon 488
  - California 491
  - Halibut fishery of the Pacific coast 506
  - Vessel fisheries at Seattle, Wash 508
- Lake fisheries 512
  - Receipts of fishery products at Chicago 530
- Fisheries of the Mississippi River and tributaries 535
  - Lake Pepin 537
  - Lake Keokuk 538
  - Mississippi River between Lake Pepin and Lake Keokuk 539
- Fisheries of Alaska 540
- Whaling 547
- Statistical survey procedure 548
- Common and scientific names of fishery products 550

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[1] Administrative Report No. 41, Appendix III to the Report of the U. S. Commissioner of Fisheries, 1940. Approved for publication June 20, 1940.

## FOREWORD

This report constitutes a summary of the activities of the Division of Fishery Industries, as well as a review of the fishery statistics collected by the Division during the past year. As its name indicates, this Division of the Bureau is concerned with the activities and welfare of the commercial fisheries and fishery industries and the fishermen and shoresmen engaged therein; the fish canning and preserving industries; and the trade in fishery products. Its functions include the conduct of studies or activities: (1) To determine the extent and magnitude of our aquatic resources and the commercial importance of our fishery industries; (2) to learn the economic condition of fishermen and shoresmen engaged in the fishery industry, their place in the national economy, and what measures can be taken to improve their well-being; (3) to determine the character, utility, and effectiveness of different forms of fishing apparatus and vessels, suggest improvements therein, and discourage the use of those forms which are unnecessarily destructive or unprofitable; (4) to learn the effect of fishing on the supply of fish and suggest measures to promote orderly and sustained production; (5) to study and develop fisheries for hitherto unutilized fishes; (6) to investigate the preservation of fishery products, suggest improved methods, and discourage wasteful practices in this field; (7) to ascertain what use can be made of aquatic products not now utilized to economic advantage; (8) to inquire into the nutritive value of aquatic foods for man and his domestic animals, and promote the consumption of these foods; (9) to ascertain the means and methods of transporting fishery products on land and sea and recommend economical practices; (10) to inquire into the condition and extent of the wholesale and retail trade in fishery products and promote the more orderly marketing of our fishery harvest; (11) to introduce useful foreign methods or processes of capture, preservation, utilization, or marketing fishery products; (12) to handle matters relative to the administration of the act which authorizes cooperative associations of producers of aquatic products; and (13) to conduct the Fishery Market News Service authorized by act of Congress in 1937.

Results of the various technological, economic, and marketing investigations carried on by the Division are published in separate documents as each project is completed, and a brief résumé of each current project is contained in this report. Information obtained from statistical surveys is published in part 2 of this report, which includes all the detailed statistical information that has become available since issuance of the previous report,[2] together with such summarized statements and interpretations of the statistics as are deemed significant and useful.

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[2] Fishery Industries of the United States, 1938, by R. H. Fiedler: Appendix III to the Report of the U. S. Commissioner of Fisheries for 1939, pp. 169–554.

## Part 1. OPERATIONS OF THE DIVISION

### COOPERATION WITH OTHER FEDERAL AGENCIES

It has been the established policy of the Bureau of Fisheries, and of this Division, to cooperate with other Federal agencies wherever the activities are such that mutual information can be exchanged with advantage, or where, by working cooperatively, the results of such mutual work may be furthered or its ends made more effective and valuable.

Thus, the technologists of this Division gave courses in canning fishery products to State Extension Service workers at the request of and with the cooperation of the Extension Service of the United States Department of Agriculture. Demonstrations and practical instruction on other related subjects pertaining to the preservation of fishery products, and a better utilization of the excellent food value of fish, were given to State Extension Service workers through and with the cooperation of the Extension Service of the United States Department of Agriculture. In some cases, students or State Extension Service workers were detailed to the Bureau's laboratories in Washington, D. C., for instruction, and in other cases one of our technologists visited some of the States for this purpose.

Cooperation was also given by members of our technological staff to chemists and bacteriologists of the Food and Drug Administration, United States Department of Agriculture, at various times in connection with the development and application of tests or methods of determining the quality and constituents of various fishery products.

The Department of Labor, through several of its divisions, has been helpful during the past year in connection with the Division's studies of the retail marketing of fish as well as studies of labor conditions in the fisheries. This Division's staff also assisted and was aided by the Maritime Commission and the Maritime Labor Board in studies of fisheries employment. Advice and assistance has been furnished the Federal Surplus Commodities Corporation in connection with its programs of buying fish for distribution to relief clients. The Food and Drug Administration of the Department of Agriculture has cooperated with this Division in furnishing current statistics on the pack of canned shrimp and allied data. Cooperation has been continued by the Bureau of Foreign and Domestic Commerce in furnishing monthly and annual statistics of foreign trade in fishery products, while the local offices of the Bureau of the Customs has furnished the several Market News offices of the Division daily statistics of the imports of fishery commodities. Assistance has been accorded by several of the economic and technological staff of the Division to the Federal Trade Commission in its work in connection with the preparation and promulgation of trade practice rules for the sardine and tuna industries.

BIOLOGICAL WOODS HOLE LIBRARY

The Division also has worked with various Federal agencies in obtaining statistical data on our fisheries. In a cooperative arrangement, the Bureau of Agricultural Economics, Department of Agriculture, furnished statistics on the volume of cold-storage holdings of fish and quantities frozen, and the health authorities in Washington, D. C., assisted in obtaining data on the volume of fish handled at the Municipal Fish Wharf and Market in this city. Cooperation was accorded the Bureau of the Census in obtaining for that Bureau figures on the volume of the quarterly production and holdings of fish oils in the United States.

In addition to the specifically enumerated instances of cooperation with other Federal agencies cited above, which are on a continuing basis or were of a more detailed nature, it should be stated that a very close relationship exists between this Division and many of those Federal agencies whose duties require an interest in fish in particular, foodstuffs or feedstuffs in general, or in various marine activities. The staff of the Division is in almost daily contact with some one or more of these Federal agencies in the exchange of information of inestimable value to the scientific work of the Federal establishment.

## COOPERATION WITH STATE AGENCIES

The Division has continued to encourage cooperative relations with State institutions and agencies in the conduct of researches and investigations of mutual interest. This policy has resulted in expanded programs and decreased costs. During 1939 the following cooperative investigations with various States were conducted:

Our Seattle technological laboratory staff has continued its close cooperative relation with members of the faculty and staff of the University of Washington, Seattle, Wash., as in past years.

The University of Maryland and the Maryland State Agricultural Experiment Station, College Park, Md., continued their excellent cooperative relations with our College Park technological laboratory staff. The various departments of animal husbandry of the Maryland State Agricultural Experiment Station continued their cooperation in the conduct of feeding tests of fishery byproducts in the rations of farm animals. The members of the staffs of these two institutions who have worked closely with our College Park technological staff are Dr. L. B. Broughton, Dean of the College of Arts and Sciences; Dr. W. C. Supplee and Mr. L. E. Bopst of the Chemistry Department; Dr. L. H. James, Head of the Department of Bacteriology; and Prof. M. H. Berry, of the Dairy Department. These various cooperative studies are described in greater detail elsewhere in this report.

As discussed in the 1938 report, the Bureau's technologists continued their cooperation with the Virginia State Division of Markets in extending and improving State marketing grades for fishery products sold in that State.

In the conduct of its statistical and market research work, the Bureau obtains unusual cooperation from various States. The statistical surveys of the fisheries in the various States bordering on the Great Lakes, the Pacific Coast States, and Maryland and Virginia have been greatly facilitated by the cooperation obtained from the fishery agencies in these States. With this aid it is now only necessary for the Bureau to conduct partial surveys in these States to supplement the data available from the fishery agencies.

During the year several members of the Bureau's staff cooperated with officials of the Maine Sea and Shore Fisheries Commission and the Connecticut State Board of Fisheries and Game in establishing systems for the collection of detailed fishery statistics in Maine and Connecticut. As the data collected by these agencies will be available to the Bureau, it is anticipated that in the future it will only be necessary for our agents to conduct limited field surveys in these States in order to obtain complete operating unit and catch data.

In addition, in nearly every other State where commercial fishing is prosecuted, some type of cooperation in its statistical work is rendered the Bureau by the State fishery agencies or other organizations. This makes it possible for the Bureau to make statistical surveys of a greater portion of our fishery industries than otherwise would be possible.

## COOPERATION WITH FISHERY ADVISORY COMMITTEE

The Division of Fishery Industries cooperated during the year with the Fishery Advisory Committee in the carrying out of the Committee's function as a body advisory to the Secretary. Technical assistance was made available to the Committee at all times, current information upon the Bureau's work was furnished from time to time for the information of the members, and help was furnished in the planning and arrangement of the annual Committee meeting.

On February 2 and 3, 1940, the annual meeting of the Committee was held in Washington, D. C., in the Conference Room of the Secretary of the Interior. Members of the staff of the Division attended. Special statements were furnished to facilitate the conduct of business and considerable assistance and advice were supplied after the meeting in the preparation of the annual report of the Committee.

## COOPERATIVE PAN-AMERICAN FISHERY RESEARCH

During the past year the Division continued work toward the development of a program for Pan-American fishery research. Following the detail of the writer as adviser on fishery matters to the President's Educational Commission, which visited Puerto Rico in April 1939, as reported in last year's report of the Division, the Bureau was allotted $25,000 by the Public Works Administration for the establishment of a fishery research laboratory in Puerto Rico. A site for this laboratory, consisting of a plot of approximately 2 acres, has been obtained on the campus of the College of Agriculture and Mechanics Arts at Mayaguez, a fishing port on the western side of the island. This was secured through the cooperation of the Board of Trustees of the University of Puerto Rico. Plans are being drafted for the construction of the laboratory building, which is expected to be ready for occupancy early in 1941.

### TECHNOLOGICAL FISHERY RESEARCH

Recent tabulations indicate that the people of Puerto Rico consume around 40 million pounds of fish annually. Except for a few million pounds produced locally, this is all imported—mostly from foreign countries. There is reason to believe that local fisheries can be expanded to supply a large part of this demand. Thus, research at the laboratory will center on the development of more efficient means for capturing local species, on exploration of nearby fishing banks to locate productive fishing areas, on technological improvement of processing methods, on means for distributing the preserved catch to the people of the island, and on the biology of various important aquatic forms. Some work may also be done on the culture and distribution of fresh-water fishes to augment the very effective work in this field now being done by the local fishery agency. The fisheries of the Virgin Islands of the United States will also benefit by research at this laboratory.

Located at the "cross roads" between North and South America, the new laboratory will also serve as a focal point for fishery research in the American republics. In addition to the permanent research staff which will be assigned to the laboratory, it is planned to employ a group of student assistants, recruited from various American republics, to assist in the research work of the laboratory. After a training period of about 2 years, these assistants would be in a position to aid their own governments in solving their local fishery problems.

In this connection the Bureau has received numerous requests from other American republics for the detail of fishery investigators to assist in the development of their local fisheries. Some assistance has already been given and further work is contemplated during the coming year. However, the requests for this type of service are greater than our ability to serve. It is believed, therefore, the establishment of the laboratory in Puerto Rico will be of material assistance in this direction.

## STATISTICS

In the development and prosecution of a fishery, it is important that statistics be collected and published on its yield and abundance. This is most necessary in order to evaluate the condition and trend of the fishery from the standpoint of conservation and sustained production. In the main there is a lack of statistical information on the fisheries of most of the countries of the Western Hemisphere. This situation was brought to the attention of delegates from various American republics attending the Eighth American Scientific Congress at Washington, D. C., in May 1940, in an address by the writer before the statistical section of the Congress on the subject "Need and plan for a statistical program in furthering conservation of Inter-American fisheries." [3] The delegates showed considerable interest toward the development of such a program and as a result the statistical section of the Congress, and the Congress in plenary session, passed the following resolution:

> Since the fishing industry represents a great natural resource both from the national and inter-American viewpoints—
>
> BE IT RESOLVED by the Eighth American Scientific Congress that the Inter-American Statistical Institute be requested to devise a plan in accordance with which the American Republics may collect and publish fishery statistics in a uniform manner.

The Inter-American Statistical Institute, based on the lines of the International Statistical Institute, was formed at the time of the congress by the American members of the International organization.

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[3] Published as Fisheries Memorandum S-352, U. S. Bureau of Fisheries, Washington, May 1940.

## EXHIBITS AT EXPOSITIONS

Exhibits depicting the contributions of the Bureau of Fisheries in the broad fields of Federal activity were displayed at the New York World's Fair and San Francisco Golden Gate International Exposition in 1939. These displays were planned with the aid of the Division of Fishery Industries.

Various display materials were furnished to individuals and groups during the year to exhibit as widely as possible through these devices the various phases of the fishery industries.

At Tampa, Fla., a diorama of the sponge fisheries of Florida was exhibited through the duration of the Pan-American Exposition in January 1939.

## ECONOMIC AND MARKETING INVESTIGATIONS

There is a constant demand upon the Division of Fishery Industries for studies of the marketing of fishery commodities and other economic studies relating to the commercial fisheries. It has been possible to undertake only one new large-scale study of this kind with available personnel and funds during the past year. However, a continuing study of cooperation among fishermen, and other long-time studies, were active during 1939, and, as is customary each year, many short-time economic and marketing studies were made in order to satisfy the urgent demands placed upon the Division. Some of these shorter studies were conducted preliminary to or closely associated with administrative activities of the Bureau and consequently were not published. Other studies, which were published through the Bureau's facilities, were also widely circulated through fishery periodicals and other publications.

One of the chief aims of the Division's marketing research is to portray the processes of fish distribution in such a way as to enable all elements of the trade to understand more completely their functions as they relate to the rest of the industry. As the details of this picture are clarified, it is possible to point out respects in which the marketing system may not operate with full efficiency. These economic studies may serve as a basis for rationalizing the distribution of fishery products, through the suggestion of remedies for various defects in the marketing system and in its operations. Since there are areas in the fish trade which are relatively unorganized as compared to many other distribution systems, and since fish consumption is unjustifiably low, this type of work should be productive.

In pursuing this program the Division carries on studies of its own, such as the retail survey and other studies discussed below. It also analyzes the products of research in other fields so as to apply to fishery marketing whatever is of significance. In this way not only new findings but new research methods and techniques are made available. Innovations in marketing practice developed in this country and abroad are also examined and given currency, if likely to be of value.

During 1939 the economic and marketing investigations of the Division were largely conducted under the immediate supervision of Ralph Russell, Associate Economist, with the assistance of Keith O. Burr, Junior Statistician.

Reports of various economic studies and activities in progress during 1939, or completed during that year, are given below.

### FISHERY COOPERATIVE ORGANIZATIONS

The research and services in regard to fishery cooperative organizations, like those in the other economic fields covered by this Division, consist primarily of collecting, analyzing, and disseminating information. An advisory service is offered to fishermen who are considering the desirability of forming cooperatives, and information is given to enable them to decide whether or not cooperative organization is likely to bring them benefits.

In addition, fishery cooperatives already in operation are advised as to how to meet characteristic problems of cooperatives, as well as difficulties peculiar to their particular situations. While it is difficult to handle requests on this subject by correspondence, our statistical agents are often able to give advice on the spot in regard to matters requiring broad knowledge of the fisheries. With specific regard to the organization of cooperatives, and with reference to cooperative principles or methods, Fishery Circular No. 22, "Organizing and Incorporating Fishery Cooperative Marketing Associations," by L. C. Salter, has been particularly useful in answering inquiries.

Cooperative associations enable fishermen to undertake collective action in conducting their economic affairs. They also serve as a device for readily disseminating information and educating fishermen as to the fundamental economic relationships of their industry. When organized into cooperative associations, fishermen can effect desirable practices whereby the fish they catch are processed and distributed. The cooperative enables them to extend their marketing operations, if necessary, into any phase of marketing which is not operating to their advantage. Through cooperatives fishermen are usually better able to control the availability, quality, and prices of supplies and services which they require. Cooperation offers a method whereby it may be possible to rehabilitate certain fish populations which have suffered severe depressions over a long period.

In the pursuit of its functions of collecting, analyzing, and disseminating information, the Bureau endeavors to keep informed of new cooperative undertakings by fishermen, and to serve as a clearing house for such material.

At present, 35 active fishery cooperatives which engaged in economic activities are listed in the Bureau's files, though full information is not available on all of them. Twenty-one are on the West coast, 11 on the East coast, and 3 in the Great Lakes region. As regards their distribution by States, California has 10, Washington 9, Oregon 2, New Jersey 3, Florida 4, Minnesota and Maine each have 2, and Michigan, Maryland, and North Carolina each have 1. Cooperatives in 3 States have suspended operations since the 1935 canvass, as follows: California 1, Minnesota 1, and Virginia 1.

During the past year the organization of 7 fishery cooperatives on the West coast was reported; 6 of these being in Washington and 1 in California. Another West coast cooperative, organized in 1938, first came to the Bureau's attention in 1939. Considerable organizational activity occurred on the East coast without as yet resulting in the formation of new cooperatives. This interest was particularly noted in Boston, Gloucester, and Martha's Vineyard, Mass., and on certain parts of the Maine coast.

Current information on cooperation among fishermen in other countries is obtained through publications and correspondence. During the year, requests for information were received from neighboring countries to the north and south of the United States. Visitors from Newfoundland, Nova Scotia, Venezuela, Brazil, and Sweden discussed cooperation among fishermen with members of our staff.

Of particular interest among foreign developments are the programs of fishery rehabilitation arising in Nova Scotia and spreading to New Brunswick, Newfoundland, British Columbia, and, to a limited extent, to the United States. The Nova Scotian development was reported by Ralph Russell in an article entitled, "Nova Scotia Fishermen Aided by Cooperatives," in the November 1939 issue of Fishery Market News. Progress in Newfoundland was summarized in the February 1940 issue of this publication in a report entitled, "Newfoundland Develops Fishermen's Cooperatives."

The process of adult education and establishment of economic enterprises, which is the fundamental concept of the programs, begins with the awakening of interest and the development of local leadership. Under their own selected leaders, the people study their economic situation and then plan to correct it. Usually a start is made by establishing credit unions. The experience gained by managing these credit unions teaches the people business methods and control of economic enterprises. Other economic and social developments usually follow and involve cooperative techniques. This program seems adaptable to conditions in some fishing areas of the United States. In fact, the movement has already begun in one or two localities. The Bureau is an interested observer of such attempts to adapt the procedure to our conditions.

A committee of the Maine State Chamber of Commerce studied the problems of the fisheries of that State and recommended the formation of a division of fishery rehabilitation in the State government. This division would undertake to evoke leadership among the fishermen so that they might initiate a program of adult education and cooperative development.

Lectures on cooperation, designed primarily for Boston fishermen, were sponsored by the Massachusetts State Board of Education. These lectures, each of which was given by a different authority in this field, extended over a period of several weeks. Among other subjects, the Nova Scotian developments were discussed.

A report containing material collected in a recent survey of fishery cooperatives in the United States was advanced further toward publication during the year, and an excerpt was printed in a report of hearings before the House Committee on Merchant Marine and Fisheries. The study dealt with data obtained from 54 of the 59 cooperative associations reporting. The number of producers dealing with these cooperatives, either directly as members or indirectly as fishermen on boats commanded by members, totaled 12,500 and the volume of business was over $9,000,000. The investment of the cooperatives in plants, equipment, and other facilities was about $5,200,000. The investment by the members of these cooperatives in fishing equipment totaled over $20,700,000 in boats and over $3,600,000 in gear.

Commercial operations of one type or another were conducted by 31 of the 59 associations reporting. Of 22 associations on the Pacific coast, 14 were commercial, while only 9 of the 22 in the North Atlantic area were commercial. The South Atlantic and Gulf area also reported a predominance of noncommercial associations, only 4 of 11 being commercial. Although no survey was made in the Great Lakes area, 3 commercial associations were located and reported.

*Number and type of fishermen's cooperatives, according to location, 1935*

| Area | Total number of associations | Number of commercial associations | Number of noncommercial associations |
|---|---|---|---|
| North Atlantic | 22 | 9 | 13 |
| South Atlantic and Gulf | 11 | 4 | 7 |
| Great Lakes | 3 | 3 | |
| Pacific coast | 22 | 14 | 8 |
| Alaska | 1 | 1 | |
| Total | 59 | 31 | 28 |

Of the 31 commercial associations shown in the above table, 13 reported business in fresh fish, 2 sold only processed fish, and 4 sold both fresh and processed fish. In addition, there were 8 cooperatives that did not handle fish for sale, but acted as bargaining associations, while 4 associations made no report as to the type of business they conducted.

Over one billion pounds of fish were sold by 19 associations reporting on volume, and the dollar volume of all associations reporting this figure totaled $8,921,615. The value of fish represented in this amount does not include all of the billion pounds, since some associations reported volume but not value.

Purchasing of supplies for members is an important function of cooperatives in this field, and 12 associations reported purchases ranging from $1,800 to $100,000, and totaling nearly $300,000. The association reporting purchases of $100,000 was engaged only in purchasing. In addition, there were 7 associations engaged in purchasing which did not report the volume. Eight other cooperatives indicated their intention to undertake purchasing for their members. Petroleum products, chiefly motor fuel, were the leading items purchased by the fishery cooperatives for their members, although nets and netting, ice, boxes, tanbark, tar, rope, and miscellaneous marine supplies and fishing equipment were also reported.

A bill (S. 2605) to amend the Agricultural Marketing Act was introduced by Senator Norris, and hearings will be held during 1940. This bill, if enacted into law, might be of some value to fishermen in that it would broaden the definition of cooperatives so as to permit Federal loans to cooperatives with a considerable proportion of nonfarmer membership. Thus, agricultural cooperatives with some fishermen members might be eligible for assistance by the Farm Credit Administration.

The report of the Maritime Labor Board, made available early in 1940, deals to some extent with the types of union organization among fishermen and among workers in allied industries. This report may well serve as a basis for further study of the status of this type of organization among fishermen.

During the year 1939 no complaints of violation of the antitrust acts by fishery cooperatives were referred to the Secretary of the Interior, who is empowered under the Fishery Cooperative Marketing Act to investigate such complaints. However, it should be noted that during the spring of 1939 a decision of a Federal district judge in Portland, Oreg., declared a fishermen's union to be a cooperative and subject to the provisions of the antitrust laws. This decision may prove of considerable importance in the field of labor problems in the fishery industry, as well as in the whole field of cooperation.

## RETAIL MARKETING OF FISH AND SHELLFISH

An extensive survey of the retailing of fresh and frozen fish was initiated early in 1939 and continued throughout the year. This study embraced many phases of fish retailing, but emphasis was upon the methods and practices of the trade. During the spring the Bureau employed 25 temporary investigators who surveyed 10,000 retail food stores in representative cities in the Eastern United States. It was found that only 4,000 of these stores handled fresh fish, and these were investigated in detail as to type of customers, nature of fish business, and facilities for handling fish. From the 6,000 stores not handling fresh fish, only a few general facts were requested.

The volume of fish sales represented by the stores which handled fresh fish amounted to over 60 million pounds in 1938, while the reported value of sales exceeded $9,000,000. These 4,000 stores, located in both commercial and residential sections of some 50 cities, include nearly 1,200 chain stores, over 2,000 independent stores and voluntary chain stores, and about 400 fish markets.

The volume of sales of fresh fish and shellfish was small for most stores, with heavy sales reported by a small percentage only. Nearly 40 percent of the stores had annual fish sales amounting to less than $500, while about 30 percent reported fish business ranging from $500 to $1,500 and almost 30 percent indicated a volume of $1,500 or more. A small percentage of the stores did not report on dollar volume of fish sales. For the entire area surveyed, sales of fish on Friday comprised about half of the total weekly sales. About one-third of the weekly sales was divided between Thursday and Saturday, but sales on Thursday were substantially above those on Saturday. The remaining sales were spread over the other days of the week, but less than one-half of 1 percent of the weekly sales occurred on Sunday.

All species that constituted any appreciable percentage of total fish sales were tabulated. However, the data regarding the number of stores selling each species are primarily useful for comparative purposes, since the schedules usually reported only the species making up the bulk of sales. The preliminary results indicate that oysters, with sales by over 2,900 stores in all cities, were reported by more stores and in a larger number of cities than any other species. Haddock, sold by nearly 2,000 stores in some 35 cities, was the second most widely distributed species and halibut, next in importance, was reported by over 1,300 stores in about 30 cities. In the distribution of fresh-water species, catfish, handled by nearly 900 stores in 36 cities, ranked first, while yellow perch was second with sales by some 550 stores in 25 cities. By further analysis of the number of cities and stores within cities that reported sales of various species, it is hoped to obtain an indication of the importance of the fisheries of different regions in supplying fresh fish and shellfish to consumers in representative localities in the Eastern United States.

The tabulation of the species sold by retailers indicates that about 150 names were reported for the salt-water species sold, about 60 for fresh-water species, and over 20 for shellfish. A preliminary analysis demonstrates that the actual numbers of species involved are much smaller than those indicated, for there is widespread confusion in the names applied to various species. Often a given species is sold by 2 or more names, even within the same city. Over larger areas the same species may be sold under several names, or several species by the same name. This lack of standardized nomenclature is a handicap to increasing the sale and consumption of fishery products.

Preliminary results of the study indicate that very few stores have extensive facilities devoted to selling fish, and only a relatively small amount of space is available for this commodity. Frequently stores handle fish only 2 or 3 days per week, and on these days fish is allocated to a small part of the space usually taken up by meats.

A large percentage of stores report that fish business is profitable, and some operators indicate that fish is the most profitable item handled. However, some owners and managers evidenced little interest in fish sales and consequently devoted little effort to promoting this phase of their business. The schedules are being further analyzed to determine which policies and methods are most effective in the sale of fishery products.

An investigation of food consumption in some of the cities included in our survey is being conducted by the Department of Labor. This material will be useful in interpreting the retail fish marketing data. It will also provide a basis for a detailed analysis of the total amount of fish consumption per capita and the relative consumption of various forms of fishery products in a considerable number of cities.

## SURPLUS-FISH SITUATION

As a result of special legislation the Federal Surplus Commodities Corporation, during the fiscal year 1937, purchased 12,059,000 pounds of fishery products at a commodity cost of $597,000, for distribution to relief clients. In the following fiscal year purchases under similar authority amounted to 3,595,000 pounds at a commodity cost of $265,000. No fish were purchased by the Corporation during the fiscal year 1939, but in the fiscal year 1940 purchases through March 14 had aggregated 382,000 pounds, with a commodity cost of $22,300. Authority for the purchase of surplus stocks of fish in 1940 was incorporated in Public Act 393, which was approved on August 11, 1939. The text of this act follows:

> *Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That any part of the funds not to exceed $1,500,000 per year, transferred by the Secretary of Agriculture to the Federal Surplus Commodities Corporation created under and to carry out the provisions of section 32 of the Act of August 24, 1935 (49 Stat. 774), as amended, may also be used by such Corporation for the purpose of diverting surplus fishery products (including fish, shellfish, mollusks, and crustacea) from the normal channels of trade and commerce by acquiring them and providing for their distribution through Federal, State, and private relief channels: *Provided,* That none of the funds made available to the Federal Surplus Commodities Corporation under this Act shall be used to

purchase any of the commodities designated in this Act which may have been produced in any foreign country. The provisions of law relating to the acquisition of materials or supplies for the United States shall not apply to the acquisition of commodities under this Act.

Sec. 2. (a) From the fund authorized to be transferred by section 1 hereof, the Secretary of Agriculture is authorized to transfer to the Secretary of the Interior sums as follows to be maintained in a separate fund, $75,000, which shall be used by the Secretary of the Interior to promote the free flow of domestically produced fishery products in commerce by conducting a fishery educational service; and $100,000, which shall be used by the Secretary of the Interior to develop and increase markets for fishery products of domestic origin.

It will be noted that Public 393 includes, as section 2, provision for expanded fisheries economic, marketing, and technological services; however, the funds for this purpose have not as yet been provided.

### COMMERCIAL FISHERIES OF THE WORLD

The world's annual catch of fishery products, based on the most recent available data, amounts to about 35,200,000,000 pounds, valued at $762,000,000. The United States, including Alaska, with a catch valued at $100,845,000, leads the countries of the world in the annual value of its yield. Japan's annual catch, valued at $100,807,000, ranks second. Other countries, the annual catch of which exceeds $50,000,000 in value, are, in order of their importance, Union of Soviet Socialist Republics; England, including Scotland, Northern Ireland, and Wales; and China. Japan, with a catch of 8,108,000,000 pounds, leads in the annual volume of the catch among the countries of the world, and following is the United States, with a catch aggregating 4,353,000,000 pounds. Other countries whose annual catches exceed 1,500,000,000 pounds are, in order of their importance, Union of Soviet Socialist Republics; China; England, including Scotland, Northern Ireland, and Wales; Norway; and Germany.

## STATISTICAL INVESTIGATIONS

Fishery statistics are collected by the Bureau to serve two principal purposes—biological and economic. For this reason the Bureau plans its statistical surveys to obtain comprehensive data which will furnish a complete and reliable picture of the condition and trend of the fisheries. The collection and compilation of these data involve many problems because the fisheries are broad in scope, including over 160 varieties of aquatic products which enter into commercial production. Many of these species are migratory and are taken by a great variety of types of gear in areas along the seacoast, or in interior lakes and streams. If the biological aspect is to be served, complete annual statistics are needed on each of these phases in every section. If the economic aspect is to be served, statistics are needed not only on the phases listed above relative to the biological aspect, but also on the price structure, the processing function, and on marketing and distributing.

It is essential that statistics on these latter phases of the industry be collected and published as soon as possible after the close of business transactions in order that they may be of maximum value to the fishery industry and other interested parties.

## BIOLOGICAL ASPECT

The biological aspect must be considered as two problems—the conservation and sustained supply of the resource, and the prediction of future trends or yields. Since the fisheries are usually prosecuted in areas not under private ownership, the problem of the conservation of these fisheries is of national concern. It is important that close watch be kept over the condition of the various fisheries in order to detect depletion, so that remedial measures can be promulgated timely and wisely. For this reason it is imperative that current statistical data be obtained on the yield of our fisheries.

These statistics furnish the biologist with a background upon which to base his prediction of future trends and yields by coupling these data with studies of the life history of the species. Difficulty is experienced in making these predictions because the supply (population) of the species cannot be seen, as is the case with farm animals or crops. The more complete and reliable the statistics on yield are, the better foundation the biologist has for conducting his studies. The Bureau, therefore, attempts to obtain a complete picture of each individual fishery to further these biological studies.

## ECONOMIC ASPECT

When the fishery has been conserved, and trends and yields of the fishery have been predicted, the problem still remains of supplying the fishery trade with the information so essential to the conduct of its business activities. In these days of increased competition the very existence of the fishery industry must depend upon reliable economic and statistical information. Such material has been especially valuable during the past few years, when it has been used in national planning. The Bureau endeavors to make its statistical surveys so complete that the industry and the various governmental organizations may turn to it for reliable fishery statistics.

## SURVEYS CONDUCTED

The statistical surveys during 1939 were conducted under the immediate supervision of Edward A. Power, Associate Statistician, who was assisted by R. T. Whiteleather, Associate Marketing Agent. The statistical surveys were conducted under the general direction of Fred F. Johnson, Assistant Chief of the Division. These surveys included the collection and dissemination of statistics of the commercial catch and its value, fishing craft and apparatus, and employment in the fisheries. In addition, data were collected on employment and compensation of those engaged in, and products of, fishery wholesale and manufacturing establishments.

Surveys were made during the year covering all coastal sections as well as the Great Lakes and a portion of the Mississippi River for 1938. Statistics of the fisheries of Alaska were collected by the Division of Alaska Fisheries.

In addition to the above, statistics were collected on the following special phases: The landings of fish by United States fishing vessels at the ports of Boston and Gloucester, Mass., Portland, Maine, and Seattle, Wash. (published monthly); the catch of mackerel in the North Atlantic fishery; the cold-storage holdings of frozen and cured fish and amount of fish frozen, which are furnished by the Bureau of Agricultural Economics (published monthly); the production, consumption, and holdings of marine-animal oils of the United States and Alaska (published quarterly by the Bureau of the Census); the production of canned fishery products and byproducts of the United States and Alaska; the transactions on the sponge exchange at Tarpon Springs, Fla.; the volume of fishery products handled at the Municipal Fish Wharf and Market, Washington, D. C.; and the volume of the United States foreign trade in fishery products, furnished by the Bureau of Foreign and Domestic Commerce.

The following statistical and marketing agents assisted in the collection and compilation of the statistical data: D. Y. Aska, R. L. Busby, C. H. Chilton, L. S. Christey, E. V. Ebner, M. J. Fraser, R. L. Greer, R. L. Hacker, V. E. Heffelfinger, C. H. Lyles, C. E. Peterson, C. J. Robbins, C. B. Tendick, and F. M. Wood.

For detailed information on the methods employed in the collection of fishery statistics the reader is referred to Administrative Report No. 37, "Fishery Industries of the United States, 1938", by R. H. Fiedler. This Report was published as Appendix III to the Report of the Commissioner of Fisheries for the fiscal year 1939.

## FISHERY MARKET NEWS SERVICE

Activities in connection with the organization and development of the Bureau's Fishery Market News Service were continued by the Division during 1939. Several features were added to the service during the year, and a field office was established at Jacksonville, Fla., early in the year. An office also was opened at New Orleans, La., early in January 1940. The Division now has in operation a total of six market news reporting offices in the field. The new features of the service and the activities of each of the field offices are discussed in appropriate sections of this report.

The offices of the Fishery Market News Service, due to their well-chosen locations, release current data covering the production and marketing of about 1½ billion of the nearly 3 billion pounds of fish and shellfish taken annually for food in the United States and Alaska. Landings of fresh fish for food listed daily in the various reports amount to one-quarter of the total annual catch, or over 750 million pounds. Daily reports of receipts at terminal markets add an additional 150 million pounds not duplicated in the landings. Periodic coverage of important canned fishery products, particularly salmon and shrimp, accounts for over 500 million pounds not otherwise included. In addition, about one-half of the fishery products in cold storage in the country are reported upon. Movements in and out of cold storage are released daily and holdings weekly.

The importance of this service to the fishery industry and allied interests is evidenced by the widespread localities and diverse classes of recipients from which requests for this service have been received. Addresses on the mailing lists include every producing and marketing area of importance in the country. Every branch of the fishing industry and numerous groups from allied fields are represented. Among the various classifications on the mailing lists are fishermen and producers; wholesale dealers; brokers; importers and exporters; buyers; retailers; chain stores; cold-storage plants; canners; salters; smokers;

byproducts manufacturers; supply firms; transportation companies; Federal, State, and municipal agencies and officials; unions; associations; fishery publications; newspapers; magazines; libraries; banks; and statistical organizations.

In addition to its activities in connection with the direction and administration of the service, the Washington office of the Fishery Market News Service prepares and disseminates periodic current reviews of fishery market information. These are issued in multilith form and distributed to fishermen, dealers in fishery commodities, and other interested parties. Between 10 and 15 of these reviews are prepared and disseminated each year. These reports, issued in a publication entitled "Fishery Market News," include summarized data made available through the daily and monthly releases of the Fishery Market News Service on the movement, prices, current status of production, and stocks on hand of fishery commodities; articles relating to the fisheries prepared by members of the Bureau's staff, members of the industry, or other parties; excerpts or abstracts from Bureau or other publications relating to the fisheries; and related information.

During 1939 the work of the Fishery Market News Service was carried on under the immediate supervision of A. W. Anderson, Fishery Marketing Specialist, and the general direction of Fred F. Johnson, Assistant Chief of the Division, Assisting in this work, with headquarters in Washington, D. C., but working both at the headquarters office and in the field, were H. E. Timmis, Fisheries Statistical and Marketing Agent, and P. W. Evans, Junior Fisheries Marketing Agent.

## FIELD OFFICES

The locations of the offices of the Fishery Market News Service have been carefully chosen in order that they might not only provide a maximum service to the important producing, shipping, or consuming communities near their locations, but that they also be of greatest possible benefit to the industry as a whole. With these important considerations in mind, field offices have been established in New York, N. Y.; Boston, Mass.; Chicago, Ill.; Seattle, Wash.; Jacksonville, Fla.; and New Orleans, La.

Probably the most important of the newer features of the Fishery Market News Service has been the utilization of the radio for the dissemination of fishery market news. Following preliminary surveys and planning during the latter part of 1939, radio programs were inaugurated early in 1940, twice daily over station WWL at New Orleans and station WJJD at Chicago. A fishery program already being broadcast over station WHDH at Boston also was augmented with data made available each day from the Fishery Market News Service at Boston. The scripts for these programs are prepared in the local Fishery Market News offices and include timely data on production, receipts, or other factors of the movement or marketing functions of fishery commodities.

A sample radio script for broadcasting Wednesday morning May 29, 1940, as prepared by the Chicago office, follows:

The following information is made available through the cooperation of the Chicago Market News Service of the United States Bureau of Fisheries:

The Chicago Wholesale Market reports that on Tuesday, May 28, trading was generally light on all varieties with the exception of lake trout and whitefish.

These items were moderate in demand and the market remained fairly steady. The remaining varieties, especially roughfish, moved slowly for the most part and prices were generally low.

Receipts of new fresh-water species for 24 hours ending at 8 a. m., Tuesday, amounted to 128,000 pounds. Trucks transported 65,000 and rail express 63,000 pounds. Individual supplies of the more important varieties, and the market trend, were as follows: Carp, 12,000 pounds, 2 to 2½ cents, liberal supplies combined with a heavy carry-over from Monday kept the market price in a low or depressed condition. Lake herring, 15,000 pounds, 6 to 7, some 8 cents, supplies increased somewhat in comparison with the past week. Prices were moderate though evidencing a downward tendency. Lake trout, 35,000 pounds, 17 to 19 cents, supplies liberal, demand fair, prices remaining steady within the moderate range. Sheepshead, 7,000 pounds, 3 to 3½ cents, supplies plentiful for demand which was rather light. Prices remained low for hard meats and semi. Suckers, 3,000 pounds, 3 to 4 cents, supplies moderate to light, demand light and market prices low. White bass, 4,000 pounds, 7 to 7½ cents, supplies liberal, demand light and prices low. Whitefish, 8,000 pounds, pound net 18 to 20 cents, some at 21 to 22 cents, gill net 17 to 19 cents, supplies moderate, demand fair, prices remaining steady within the moderate to low range. Yellow pike, 9,000 pounds, 12 to 13 cents, demand rather light with prices remaining fairly steady.

The local cold-storage warehouses reported on Monday, May 27, a moderate movement taking place. Approximately 13,000 pounds were frozen, consisting largely of 9,000 pounds of blue and sauger pike; 1,000 pounds each of lake herring and sturgeon, and lesser amounts of fillets, lake trout, and pickerel. Approximately 9,000 pounds were withdrawn from the warehouses, consisting mainly of 4,000 pounds of whitefish, 2,000 pounds of lake herring, and 1,000 pounds of lake trout.

Arrangements are now being made not only for market news broadcasts in the other cities where the Division maintains Fishery Market News offices, but also for the conduct of broadcasts to acquaint the general public with information of assistance in buying fish and shellfish, and on the nutritional value of these commodities.

The activities of each of the Division's Fishery Market News offices are here discussed in greater detail.

### NEW YORK, N. Y.

The release of reports from the New York office of the Fishery Market News Service was continued during 1939 on a daily basis, with the exception of Sunday and holidays. There were no major changes in the form of these reports from those prepared and disseminated in the preceding year; however, the coverage of firms reporting their daily receipts to the Market News office has been expanded to include most of the hotel supply firms, as well as a majority of the local filleting companies. It also was found possible, through a detailed study of the office procedures, to further simplify certain of the practices and effect greater efficiency and speed, which are essential to a Market News office.

Persons in the fishery and allied industries in the vicinity of New York and elsewhere are placing more and more dependence upon this office as a source of market and other fisheries information. Not only has the mailing list for the daily reports continued to grow, but inquiries by telephone, mail, and by personal visit continue to increase. Persons from the fishery industry in particular avail themselves of the opportunity of making personal contacts with this office; however, other callers conferring with the New York staff for information essential to their activities include representatives of transportation agencies; food editors of publications; editors of trade and industrial magazines; press associations; foreign fishery experts, editors and students; research students; representatives of other Federal agencies; and agents of city, State, and foreign governments.

During 1939 over 261 million pounds of fresh and frozen fishery products were received in New York. Wholesale dealers in fish and shellfish on the New York Salt-water Market reported to the New York Market News office receipts totaling 228,293,000 pounds, including incomplete data from filleting and hotel supply firms. In addition, imports received by steamship and entered at New York City amounted to 7,711,000 pounds. Detailed records covering the volume of fresh-water fishery products received at Peck Slip are not available, but it is estimated that these receipts totaled about 25 million pounds.

Of the fishery products received at the Salt-water Market, 219,607,000 pounds, or 96 percent, were shipped from domestic sources comprising 27 States and Alaska. The remaining 4 percent consisted of imports, not entered at New York City, from 6 Provinces of Canada and Newfoundland.

Of the Salt-water Market receipts, 122,867,000 pounds, or 54 percent, were transported by truck. Over 21 percent came by freight, 18 percent was landed by fishing craft, 6 percent arrived by express, and less than one-half of 1 percent by coastwise vessels. Domestic shipments were distributed almost exactly in the same manner as the total shipments. The fishery products from Canada and Newfoundland, however, arrived almost exclusively by rail; freight shipments constituting 55 percent and express 44 percent.

Massachusetts, with 57,381,000 pounds, or 25 percent, was the shipper of the greatest volume of fishery products to the Salt-water Market from a single geographical area, well over one-half being shipped by freight and most of the balance by truck. New York State was the second largest supplier, its shipments, practically all by truck, amounting to 22 percent. Fishing craft docking directly at the Salt-water Market were next, landing 18 percent. Following in order were New Jersey, with 7 percent; Florida, 4 percent; and Connecticut and North Carolina, each 3 percent.

Salt-water fish constituted 159,332,000 pounds, or 70 percent, of the total salt-water market receipts. Slightly less than one-half arrived by truck, the remainder being about equally divided between freight shipments and fishing-craft landings.

Of the salt-water fish, flounders—including blackbacks, dabs, gray sole, fluke, lemon sole, and yellowtails—were received in the greatest volume, 39,197,000 pounds, or 25 percent. One-half was shipped by truck and one-third by freight. Cod, with 20,186,000 pounds, or 13 percent, followed, the bulk arriving by freight. Next were haddock, 9 percent, mainly fishing-craft landings; mackerel, 7 percent, mostly truck receipts; and butterfish and scup, each 6 percent, largely truck receipts and fishing-craft landings.

Shellfish and miscellaneous fishery products accounted for most of the remaining 68,582,000 pounds, or 30 percent, four-fifths arriving at the Salt-water Market by truck. Hard clams in the shell, totaling 23,589,000 pounds, formed 34 percent of these products, and practically all the clams were transported by truck. The next most important shellfish items were shrimp, 22 percent, the bulk arriving by truck, and oysters in the shell, 13 percent, almost entirely truck receipts.

Receipts of fresh-water fish at the Salt-water Market were negligible; carp, the largest quantity as well as the most important species, arriving mainly by express.

Of the 7,711,000 pounds of imported fishery products received by steamship and entered at New York City, 3,914,000 pounds, or 51 percent, were classified as fish, and the remainder as shellfish and miscellaneous products. Sixty-one percent of the fish was frozen swordfish from Japan. Frozen sturgeon, 8 percent, mostly from Russia, and frozen smelt, 7 percent, largely from Newfoundland, were the next most important items.

Of the shellfish and miscellaneous fishery products, frozen spiny lobster tails, almost exclusively from the Union of South Africa, amounted to 37 percent. Next in importance were snails, 20 percent, mainly from Morocco, and frozen pulpi, 15 percent, mostly from Portugal.

Japan supplied 2,801,000 pounds, or 36 percent, of all the imports; about 90 percent of which were frozen swordfish. Imports from Portugal accounted for 10 percent, mostly frozen pulpi and frozen sepia. Morocco sent 9 percent, all snails; and Russia 7 percent, largely frozen sturgeon and frozen salmon.

The operations of the Fishery Market News office in New York City during 1939 were carried on and the daily report issued under the supervision of Wm. H. Dumont, Senior Fisheries Marketing Agent, assisted by F. J. Anderson, W. D. Glidden, Jr., and C. W. Morrison, Junior Statistical and Marketing Agents, Joseph Pileggi, Assistant Clerk, and Peter DiMarco, Junior Clerk.

### BOSTON, MASS.

The Fishery Market News Service at Boston has been augmented by several new features. These have included the addition of data in the daily reports on the range of prices of fish sold through the New England Fish Exchange; the wholesale prices of fillets of important species; the volume of fish livers landed by fishing craft each day; and the daily movements and weekly holdings of frozen fish at Gloucester. Monthly summaries of receipts and prices, together with appropriate comparisons with the preceding months, also were inaugurated during the year. Of outstanding importance also has been the cooperation of the Market News Service in Boston in supplying current news to station WHDH to augment its radio program relating to fisheries. Particularly is this radio service of interest to fishing craft at sea, since it furnishes them with the latest available information on supplies and prices and consequently gives them a basis on which to determine the most suitable time for landing their fares.

As in the case of the Fishery Market News Service in New York, the service in Boston extends far beyond the release of its daily, monthly, and annual reports. Requests for specialized information available from this office are received daily by telephone, mail, and from individuals calling at the office. Visits to the office are convenient for persons in Boston's fishery industry, since the Fishery Market News office is located on Northern Avenue near the Fish Pier.

Landings at the Boston Fish Pier sold through the New England Fish Exchange during 1939 amounted to nearly 275 million pounds, valued at about $7,700,000, which represented a decrease of 8 percent in volume but an increase of 5 percent in value as compared with the landings in the preceding year. Decreased landings of cod, cusk, flounders, mackerel, pollock, rosefish, and whiting all contributed to the reduced receipts in 1939.

Higher average prices were paid for all varieties except flounders, mackerel, and swordfish landed by offshore vessels, and flounders and whiting taken by inshore craft. The average price paid for all varieties was $2.79 per hundredweight, as compared with $2.44 in 1938. The average price paid offshore vessels increased to $2.84 from $2.45 in 1938, while inshore craft received an average of $2.40 as compared with $2.36.

The activities of the Boston office and the issuance of the daily reports and monthly summaries were under the supervision of B. E. Lindgren, Senior Fisheries Statistical and Marketing Agent, who was assisted by J. J. O'Brien, Senior Clerk, and D. L. Knox, Junior Clerk.

For further statistical data on the landings of fish at Boston as well as at Gloucester and New Bedford, Mass., and Portland, Maine, see pages 312 to 346 of this report.

### CHICAGO, ILL.

Outstanding among the newer developments in the Fishery Market News Service at Chicago has been the inauguration of a program for the wider and more rapid dissemination of market news information by radio. Two programs are broadcast daily providing shippers in the Great Lakes area with timely information regarding the market for fresh-water fish in both Chicago and New York. It is believed that this service will become increasingly valuable, permitting producers to gauge more accurately the proper volume of production and enabling shippers to determine when and where they should ship.

The large volume of data collected daily in Chicago constantly is being made available to the industry in new and more useful forms. A summary of the data in the daily reports for the preceding week is released each Monday, providing an opportune review of the market. The monthly summary has been expanded to include detailed current and comparative figures on market receipts with particular respect to the origin and method of transportation. Despite the added information and increased volume, the monthly summaries continue to retain their timeliness, each being available to the trade within 10 days after the close of the month covered. An annual summary also is prepared.

During 1939 the rail arrivals reported by express and freight terminals to the Chicago Market News office, and the truck receipts reported by wholesale dealers, amounted to 48,419,000 pounds. About 72 percent, 34,654,000 pounds, was shipped to Chicago from domestic sources—31 States and Alaska. The remaining 28 percent, which also included "in-bond" shipments from Alaska, was imported from 8 Canadian Provinces.

Thirty-six percent of the total, 17,315,000 pounds, arrived by rail freight, 34 percent by express, and 30 percent by truck. Domestic shipments reversed this order—37 percent being shipped by truck, 33 percent by express, and 30 percent by freight. Shippers of imported fishery products, due to the distant production areas, favored rail freight transportation; 50 percent being transported in this manner, 38 percent by express, and only 12 percent by truck.

The State of Michigan shipped to Chicago 6,219,000 pounds of fishery products amounting to 13 percent of the year's supply, mostly by express; followed by Wisconsin with 12 percent, mainly by truck; British Columbia with 11 percent, almost equally divided between express and freight; and Manitoba with 10 percent, largely by freight.

Fresh-water varieties of fishery products constituted 26,891,000 pounds, or 55 percent of Chicago's receipts; salt-water species 26 percent; and shellfish and miscellaneous classifications 19 percent. Fresh-water fish arrived in the greatest quantity by truck and express, salt-water fish by freight and express, and shellfish mostly by freight. Of the fresh-water fish 20 percent, 5,246,000 pounds, was lake trout, being shipped mostly from Michigan by express and from Wisconsin by truck. Thirteen percent was sauger, practically all from Manitoba and largely by freight; and 11 percent was whitefish, mostly from Michigan by express.

Halibut, with 6,725,000 pounds, was shipped to Chicago in greater volume than any other item, and dominated the salt-water fishery supplies. It furnished 54 percent of the 12,476,000 pounds, as compared with 16 percent for rosefish fillets, the next most important variety. There were slightly more fresh than frozen halibut, British Columbia sending the bulk of each classification. The fresh fish were shipped by express and the frozen fish by freight. Rosefish fillets came almost exclusively from Massachusetts, by far the greater amount by truck.

Shrimp, with 6,398,000 pounds, followed halibut in volume and constituted 71 percent of the 9,052,000 pounds of shellfish and miscellaneous varieties. Louisiana shipped about two-thirds of the shrimp and Texas about one-third, nearly all being transported by freight.

The activities of the Chicago office during 1939 were supervised by E. C. Hinsdale, Fisheries Marketing Agent, assisted by B. F. Lucarz, Junior Clerk.

### SEATTLE, WASH.

During 1939 the Seattle reports were expanded to include data each day on the receipts and prices of Alaska halibut and troll-caught salmon at Ketchikan, Juneau, Petersburg, and Sitka and weekly receipts at Wrangell. Bureau representatives transmit these data through the cooperation of the Army Signal Corps. Additional coverage during 1939 was obtained by arrangements with the Canadian Government, through the Halibut Marketing Board at Vancouver, B. C., to receive daily information on the sales of the halibut fleet over the Vancouver fish exchange. With daily receipts and prices now included for these ports, the Seattle market news report presents a current picture of fish receipts throughout Southeastern Alaska, British Columbia, and most of Washington. Plans are now under way to include daily receipts of troll-caught salmon and halibut landings at Eureka, Calif., during the 1940 season.

Another addition to the Seattle reports during 1939 was the development of a weekly summary of fish receipts at Seattle, and a written summary of market conditions, trends, and comparisons with the preceding week's receipts. These summaries are issued every Tuesday and cover the week ending the previous Saturday.

During 1939 it was also possible to obtain and publish weekly statistics on the pack of canned salmon in Alaska, British Columbia, and

Puget Sound, with comparative data for the same period during previous years. Unsold stocks and prices of canned salmon also are reported monthly, with comparative data for the preceding year. Statistics further are obtained and published showing the landings of pilchard in British Columbia, Washington, and Oregon, on a weekly basis. Plans to include similar data for California during the 1940 season are now being made.

Fresh-fish landings at Seattle during the 12-month period ending December 31, 1939, amounted to 47,250,000 pounds, valued at approximately $3,225,000 to the fishermen. This represented a decrease of 3,750,000 pounds as compared with 1938, but a decrease of only $50,000 in value. The principal decreases during 1939 were noted in the receipts of chum, or fall salmon, at Seattle, which declined over 3½ million pounds, and halibut, which decreased approximately 1 million pounds, as compared with 1938.

During 1939 the Seattle office was operated and the daily report was issued under the general supervision of V. J. Samson, Fisheries Statistical and Marketing Agent, assisted by K. G. Nordquist, Junior Clerk.

For further statistical data on the landings of fish at Seattle see pages 506 to 511 of this report.

### JACKSONVILLE, FLA.

The Fishery Market News Service was inaugurated in Jacksonville early in 1939. The daily report carries the commercial production of fishery products for the majority of the important producing areas in Florida; lists the outgoing shipments by motortruck, rail freight, and express; quotes New York receipts and prices for southern varieties of fish; and summarizes Boston landings and first sales prices. The cold-storage movements and holdings in a number of warehouses in the South Atlantic States are included weekly. A detailed tabulation of the pack of shrimp produced under the supervision of the Seafood Inspection Service of the Food and Drug Administration also is incorporated. The activities of the industry, as reported during the preceding week, are summarized, reviewed, and carried each Monday.

Florida annually produces approximately 70 million pounds of food fish, about 40 percent of which is mullet. Spanish mackerel, red snapper, grouper, bluefish, kingfish, and spotted sea trout are other important marine varieties, while catfish and bullheads are the predominating fresh-water species. The annual shellfish production approximates 20 million pounds. Over one-half of this total consists of shrimp, and crabs make up the major portion of the balance.

Food fish and shellfish are handled by 273 producer-wholesalers in 97 localities. Of the total, 211 produce salt-water fish at 76 localities; 10 producing 1,000,000 pounds or more yearly, 15 producing from 500,000 to 1,000,000 pounds, and 186 producing less than 500,000 pounds. Fresh-water fish are produced by 29 producers at 14 localities, shucked oysters by 42 producers at 20 localities, raw shrimp by 28 producers at 9 localities, crab meat by 24 producers at 18 localities, dry salt fish by 21 producers at 12 localities, sea crawfish by 18 producers at 4 localities, bay scallops by 13 producers at 9 localities, and spiny lobster meat by 3 producers at 2 localities. In addition, at a few localities, stone crabs, conchs, hard clams, green sea turtles, and soft-shell turtles are produced. There are 8 canning plants at 6 localities packing shrimp, oysters, hard clam products, turtle meat and soup, coquina broth, and frog legs. There also are 5 menhaden meal and oil plants and several shark products and shell novelty companies.

Shipments of fishery products from Florida are made by motortruck, rail freight and express; only nominal quantities being transported by steamship. It is estimated that approximately 59 percent of the fresh fish is shipped in bulk, 35 percent in barrels, 5 percent in 100-pound boxes, and 1 percent in containers of miscellaneous sizes.

After excluding August and September, for which records are not available, truck shipments reported from the Atlantic coast of Florida, and lower Gulf coast as far west as Cedar Keys, totaled about 18 million pounds, or an average of 2,250,000 pounds monthly during the period March to December, 1939.

Rail shipments and passings covering virtually all movements of fishery products by this type of carrier from the Peninsula of Florida, with the exception of some express shipments from middle and upper Gulf coast sections, totaled, during the 10 months from March to December, 1939, 115 carloads of fresh fish, 8 carloads of frozen fish, 1 car of frozen shrimp, and 32,396 express packages of unclassified fishery products. Of the 115 carloads of fresh fish, 59 were shipped during December.

During the first 6 months of the shrimp season starting July 1, 1939, the 40 canneries under the supervision of the Seafood Inspection Service of the Food and Drug Administration operated an average of 63 days each and packed a total of 1,048,754 standard cases of shrimp from 56,512,000 pounds of raw shrimp. The pack was divided into 824,000 cases of wet-pack shrimp in 5¾-oz. tins, 179,000 cases of dry pack shrimp in 5-oz. tins, about 25,000 cases in miscellaneous sizes of tins, and 21,000 cases in glass containers.

During 1939 S. C. Denham, Fisheries Statistical and Marketing Agent, supervised the Jacksonville Fishery Market News office, assisted by J. E. Borum, Junior Clerk.

### NEW ORLEANS, LA.

The work of organizing the Fishery Market News Service at New Orleans was started in October 1939, and the first daily report was issued on January 5, 1940. New Orleans is not important in itself as a production center for fishery commodities, but it is the largest centrally located city in the Gulf States and this area is important in the production and distribution of many fishery commodities, particularly shrimp. Considerable dependence is placed upon the market news reporters for furnishing daily information on the status of the fisheries along the Gulf coast to the Market News office in New Orleans. These market news reporters, who are employed on a part-time basis, are located in important producing centers in Alabama, Mississippi, Louisiana, and Texas.

The first section of the daily report issued by the New Orleans office includes information on the production of fish and shellfish in the Gulf producing area. This section is followed by information on carlot rail shipments of fresh and frozen fishery commodities from the Gulf States; express shipments of these commodities from New Orleans; passings of fishery products through New Orleans; rail arrivals in New Orleans; prices in the New Orleans French market; and marine weather and river forecasts which are furnished by the Weather Bureau. The report also includes daily prices at New York and Chicago for species of local interest; daily cold storage movements and holdings of shrimp; weekly cold storage movements and holdings of all fishery commodities in the Gulf States, and of shrimp in other areas; weekly data on the pack of shrimp by canneries operating under the Seafood Inspection Service of the Food and Drug Administration of the Department of Agriculture; and a weekly summary of the production, shipments, and prices of Gulf fishery products.

Late in January 1940 arrangements were completed with radio station WWL in New Orleans for the broadcasting twice daily of summarized market information. These broadcasts have enabled the industry and allied interests to obtain market information earlier than through the mimeographed releases distributed by mail. Considerable interest has been manifested in the inauguration of this new service, and it has been followed by the establishment of radio market news services in other cities in which the Bureau has Market News offices.

While many species of fish and shellfish contribute to the important fishery industry of the Gulf States, shrimp is by far the most important species, both with respect to volume and value. Although the bulk of the catch of shrimp is canned, large quantities also are marketed either fresh, dried, frozen, or "cooked and peeled." There is a considerable concentration of the shrimp canning industry at Biloxi, Miss., and in the area surrounding Houma, La., both of which are within a 100-mile radius of New Orleans. A large part of the shrimp consumed in New Orleans and its adjacent territory is landed in the Buras, La., area, near the mouth of the Mississippi River. This shrimp is usually sold "heads on," due to a local preference for it in this form. On the other hand, fresh shrimp handled by dealers in the vicinity of Morgan City and Berwick, La., is prepared as "headless" shrimp for the northern markets. The shrimp-drying industry, which is centered in Terrebonne and Jefferson Parishes, south of Houma, commonly utilizes shrimp which is small or mixed in size. A large part of this product is normally exported to the Orient. Shrimp is frozen in several localities along the Gulf coast, the most important freezing centers being New Orleans and Galveston, Tex.

Considerable quantities of fresh shrimp are utilized in the production of shrimp meat or as "cooked and peeled" shrimp. This product is normally packed in 5-pound cans, iced, and shipped to both local and distant markets. It is produced principally in the region between Berwick, La., and Biloxi, Miss.

The oyster and crab industry of the Gulf coast is also of importance. Large quantities of oysters are canned, some sold in the shell, and the balance shucked. After cooking crabs, the meat is usually removed and packed in cans, iced, and shipped to local and northern markets. One cannery in Louisiana is engaged in the processing of crab meat in hermetically sealed cans. There also is a considerable fishery for soft crabs in the vicinity of New Orleans, although it is primarily for nearby markets.

The production of fish in Louisiana and Mississippi is mainly of local interest, with only small quantities being shipped to other markets. However, larger quantities of fish are produced in Alabama and considerable quantities are shipped into other Southern as well as Northern States.

The New Orleans Fishery Market News office is supervised by C. E. Peterson, Fisheries Statistical and Marketing Agent, who is assisted by R. A. Hoerner, Junior Clerk.

## TECHNOLOGICAL INVESTIGATIONS

The purpose of the technological investigations of the Bureau of Fisheries is to increase the economic value of the fishery harvest by more complete and efficient utilization. Toward this end, studies are conducted of the technical phases of fish production, processing, and marketing. In planning these studies efforts are made to select those which have a broad fundamental application.

An important problem facing the fishery industry, and common to many other food industries, is that of seasonal gluts and other irregularities of production. This problem has both its economic and technological aspects. From the economic standpoint the influence of these irregularities on distribution and prices is quite obvious. However, it may be that through further technological research new methods of preserving and storing fishery products may be developed which will assist in adjusting distribution of fishery products to the ability of the markets to absorb them. Such control of the flow of products to the market would tend to eliminate ruinous fluctuations in prices. Therefore, research is being conducted on the refrigeration of fish and its various ramifications, including the role of the individual cold-storage locker in effecting the removal of surplus fish from the market.

The maintenance and improvement of quality in byproducts is another problem of primary concern to the fishery industry which is receiving continuous study. In this connection it is interesting to note that technological research was responsible for improvement in the quality of fish meal, and shifted this product from the fertilizer field to the field of animal foodstuffs, the latter being a more profitable outlet.

A further problem facing the fishery industry is that relative to grading and standardization of fishery products. Through the interests of a section of the industry, companion bills were introduced in Congress (H. R. 6130 and S. 2380, 76th Cong.) to provide for a mandatory or compulsory inspection and permissive or voluntary grading service for fish and fishery products. Hearings were held during the early part of 1940 on H. R. 6130 by the Committee on Merchant Marine and Fisheries of the House of Representatives, but the testimony adduced by witnesses at the hearings indicated that the provisions of the bill had rather far-reaching consequences, and the bill was not reported out by the committee. Later, however, another bill was introduced in the Senate (S. 3576) which would limit the inspection and grading services to fish to be frozen and frozen fish. This was still pending before the Senate Committee at the time this report was prepared.

The value of technological investigations to the welfare of our people does not end with aiding the fishing industry, for other American industries also are making extended use of the results of this work. For example, the Bureau of Fisheries pioneered in this country in the development of quick-freezing methods as adaptable to the preservation of fishery products. These methods now have widespread application in the preservation of a large number of other foods such as fruits, vegetables, poultry, and meat. In another instance the Bureau led in the search for new sources of vitamins A and D, and found that oils from many species of fish are rich in these vitamins. A direct outgrowth of these investigations is the manufacture of high-vitamin oils from the livers and viscera of various species of fish such as halibut, tuna, and swordfish. Formerly, only cod livers were used for this purpose. This has resulted not only in raising the income of the fishery industry through the sale of products heretofore wasted, but it has also been a boon to the drug industry. Of most importance, however, is the contribution of this work to the health of our people by providing an economical and convenient source of vitamins A and D.

## LABORATORIES

The Division carried on its technological studies during 1939 under the direction of Dr. J. R. Manning, Senior Technologist, until his death in August, and since that time under the direction of J. M. Lemon, Technologist. These studies were conducted at the Bureau's laboratories located in Washington, D. C., College Park, Md., and Seattle, Wash. In addition, members of our technological staff cooperated in the conduct of investigations in the laboratories of the University of Maryland and Maryland State Agricultural Experiment Station at College Park, Md.; the University of Washington, Seattle, Wash.; and Washington State College, Pullman, Wash.

The following personnel, in the various laboratories listed below, contributed to the technological investigations described in the ensuing pages of this report:

*College Park, Md.*—J. M. Lemon, Technologist in Charge; W. T. Conn (deceased) and S. R. Pottinger, Assistant Technologists; Dr. H. W. Nilson, Assistant Pharmacologist; C. F. Lee, W. B. Lanham, Jr., A. L. Fowler (resigned), and W. H. Baldwin, Junior Chemists; J. F. Puncochar and Dr. R. J. Reedy, Junior Bacteriologists; H. E. Crowther, C. E. Swift, and R. H. Flowers, Research Associates; L. F. Ortenzio, H. F. Kraybill, N. G. Sprague, L. J. Barton, R. C. Dawson, Research Fellows; and Roscoe Dwiggins, J. D. Rollow, Ned Oakley, D. J. Bowman, and C. M. Forsythe, Student Assistants.

*Seattle, Wash.*—R. W. Harrison, Technologist in Charge; M. E. Stansby, Assistant Technologist; and L. O. Simenson, William Clegg, Robert Carlton, Marie Sater, William Winberg, and Leslie Lowen, Chemical or Research Assistants.

*Washington, D. C.*—N. D. Jarvis, Associate Technologist.

### COLLEGE PARK, MD.

Additional facilities for scientific study of problems concerning the fishing industry on the Atlantic coast will be provided the Bureau through an allotment of $100,000 from the Public Works Administration for the construction of a technological laboratory building on the campus of the University of Maryland at College Park.

The plans contemplate erection of a building which will permit consolidation of the Bureau's technological laboratories which are now in operation in various buildings of the university, and in the Commerce Building at Washington, D. C. This will provide unified facilities for the study of problems facing the fishery industry of the Atlantic coast.

The work of the College Park Laboratory is in three principal fields: First, chemical and engineering studies on the preservation and utilization of fishery products; second, nutritional and pharmacological studies with fishery products; and third, bacteriological and sanitation studies involving fishery products.

### SEATTLE, WASH.

Various improvements were made at the technological laboratory at Seattle in order to increase our facilities for chemical studies in fishery products. Among these were the construction and installation of a special fume hood for exhausting inflammable solvent vapors; a 4- by 8-foot chemical laboratory table with center sink, water, gas, and electrical services; a 2- by 10-foot wall-type titration and apparatus table; and several work tables.

### KETCHIKAN, ALASKA

In view of the necessity for technical research from the national standpoint, plans have been prepared by the Bureau for the establishment of a fully equipped fishery products laboratory in Ketchikan, at a cost of $50,000, made possible by an allotment from the Public Works Administration. This laboratory will be maintained in cooperation with the Territory, a sum of $20,000 having been appropriated by the Territorial Legislature for this purpose. The Territorial contribution will be administered by the Fisheries Experimental Commission appointed by the Governor of Alaska in accordance with the provisions of the Territorial Act. Establishment of a laboratory of this type in Alaska will fill the pressing need for a greater fund of technical knowledge regarding the utilization of the fishery harvest of Alaska and will, in effect, double the Bureau's facilities for technological research on the Pacific coast.

The research program of the Alaska Laboratory will be concerned with increasing the utilization of fishery waste materials now being discarded; improvement of methods for handling, preserving, and marketing the various species of fish and shellfish now taken commercially for consumption as food; and the development of new and useful products from species of fish and shellfish present in Alaskan waters which heretofore have not been commercially utilized to any extent; all having the primary aim of increasing the value of the fishery industries in the Territory and stimulating and extending employment.

### MAYAGUEZ, P. R.

As indicated previously, plans also call for the establishment of a fishery products laboratory in Mayaguez, made possible by an allotment of $25,000 from the Public Works Administration. Here studies will be conducted on fish production, preserving, and marketing, as related to the fishery industry in Puerto Rico and the Virgin Islands.

## PRESERVATION OF FISHERY PRODUCTS FOR FOOD

Studies on this phase of fishery technology are conducted in the field of chemistry, bacteriology, and engineering. These studies are for the purpose of improving the quality of fishery food products; development of scientific tests for judging the quality of fishery products; development of methods for improving the sanitary conditions in fish-packing plants; and the development of additional fresh, frozen, cured, and canned fish foods. During the past year there have been many demands on the Bureau for research on problems of this type. This is indicative of the desire of the fishery industry to place on the market a food product which will meet the most exacting requirements as to quality and wholesomeness, and of the desire to make the most effective use of the fishery harvest. Not only has the fishery industry been instrumental in having these studies conducted, but it has been quick to adapt to commercial practice many of the recommendations of the Bureau resulting from this work. During 1939 studies on the preservation of fishery products for food were conducted in the Bureau's technological laboratories at College Park, Md., Seattle, Wash., and Washington, D. C.

### PREPARATION OF CRAB MEAT

Bacteriological and chemical studies of the commercial preparation of the meat of the blue crab (*Callinectes sapidus*), which were begun in 1938, were continued during the past year. These studies were conducted for the purpose of developing more rapid chemical and bacteriological tests for judging the quality of crab meat, for exploring new methods for the packing of crab meat, for effecting improvements in plant equipment, and for more efficient and sanitary handling of crab meat. Following the completion of the work at a temporary laboratory in Crisfield, Md., where bacteriological investigations of the various operations required in the preparation of crab meat were made under actual plant conditions, the laboratory equipment was returned to the Bureau's laboratory at College Park, Md., where additional work was conducted.

Studies to develop a more rapid chemical test for determining the quality of crab meat were conducted on the product as stored in ice under the same conditions as practiced commercially. The following chemical reactions were given consideration as a basis for possible tests for detecting freshness in the crab meat: Degree of acidity or alkalinity (pH), ammonia formation, hydrogen sulfide formation, and the electrometric test for relative freshness.[4] In studying the degree of acidity or alkalinity of the crab meat, it was found that the pH of the "lump" or white meat increased from about 7.2 in the fresh product to about 7.9 in the stale meat, while the claw meat showed very little variation in pH between the fresh and the stale product. This indicates that the pH test has promise of commercial application at least on the white meat. In studying the formation of ammonia in the crab meat under storage, it was found to increase steadily to a value of about 400 parts per million for white meat and 500 parts per million for claw meat, when a stale odor was evident. This reaction also has promise of commercial application. The formation of hydrogen sulfide could not be detected in white meat and only a trace in claw meat while still in an edible condition. Therefore, this reaction seems to have no value as a test for freshness. The results obtained by the electrometric test for freshness as now operated cannot be relied upon when applied to crab meat because under commercial practice the crab meat is cooked prior to storage and sale.

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[4] The electrometric test was developed for testing the quality of fish such as haddock by technologists of the Bureau of Fisheries. The details of this test are contained in "An Electrometric Method for Detection of Relative Freshness of Haddock," by Maurice E. Stansby and James M. Lemon, U. S. Bureau of Fisheries. Industrial and Engineering Chemistry, Vol. 5, pp. 208–211, May 1933.

Studies to develop a bacteriological test for judging the quality of crab meat were continued at Crisfield, Md., where a large number of cultures were prepared of the various types of bacteria found in that locality. A study of the differential cultural characteristics of the organisms so isolated is now in progress.

Various methods were studied for processing crab meat to retard spoilage. One showing promise of possible use as a precautionary measure to insure the elimination of *Bacillus coli*, and also to reduce the total number of bacteria in the meat, consisted of the pasteurization of the meat after packing in 1-pound cans. It was found that by heating the packed meat for a period of 10 minutes in a steam cooker at a pressure of 5 pounds per square inch, all *B. coli* which had been experimentally inoculated into the meat were destroyed. The total number of bacteria also was lowered considerably as a result of this pasteurization, and the keeping quality of the meat improved as compared with that of the commercially prepared product. The change in the appearance of the meat was negligible, and only a slight decrease in weight occurred.

In connection with the chemical and bacteriological studies relative to the testing and packing of crab meat, an engineering and sanitary study was made of the physical equipment in crab-picking plants located in the area between Maryland and Louisiana. This work was conducted for the purpose of securing information on the most efficient labor and handling practices, and to obtain data on technique for maintaining the plants in a sanitary condition. Following the study, a sanitary code was developed for the preparation of crab meat in cooperation with the industry and at the request of a group of crab packers and other interests. This code was presented to the entire crab-picking industry in the Chespeake Bay area for its guidance. It is understood that this has been adopted by the majority of the crab-packing plants in this area and has resulted in placing a product of higher quality on the market.

Following is the full text of the code:

## SANITARY CODE FOR THE PREPARATION OF CRAB MEAT

### I. Buildings and Equipment.

a. *Walls.*—Walls, partitions, and ceilings should be as smooth as possible, with no crevices to retain dirt. They should be coated with a washable paint. The picking and packing rooms should be painted white; other rooms should be painted a light color. All openings in walls should be screened and ratproofed.

b. *Floors.*—All floors should be constructed of concrete laid in a single piece. The surfaces should be smooth and waterproofed to permit easy cleaning and should be inclined slightly in the direction of the drains to insure complete drainage of all waste water. Drains should not be simply holes, but should be fitted with drain pipes that have been ratproofed. These drain pipes should either lead into a sewer or should drain out into the water. In plants that are constructed over the water on pilings, floors of wood are permissible if the pilings are of insufficient strength to support a concrete floor. However, provisions should be made for ratproofing and proper drainage.

c. *Screens.*—All doors, windows, and ventilators should be screened. Screen doors should close automatically and should fit tightly for protection against flies, other insects, and vermin. As an extra precaution, flypaper or a nonpoisonous insect spray should be used to destroy flies inside the plant.

d. *Toilets and hand-washing facilities.*—Toilets should be of sanitary construction and be of the type approved by the State board of health. Privies should be located at least 50 feet from the plant and be so placed that drainage from them will not contaminate the water supply if the supply is from wells. Toilet paper should be provided at all times.

Facilities for washing hands should be provided in the picking room and the packing room. Running water, liquid soap, paper towels, and a chlorine solution of at least 100 parts per million available chlorine, should be available at all times.

e. *Plant layout.*—Separate space should be provided for each of the various operations. Picking and packing should be done in separate rooms. The cooking room should be separated from the cooling room. A dressing room should also be provided and the hanging of garments in any other place should be strictly prohibited.

f. *Lighting and ventilation.*—Adequate light and ventilation should be provided. Windows should be large and numerous. If windows are obstructed, skylights should be provided. Artificial lights for night operation should be so placed as to provide for even illumination.

g. *Cooking.*—The space provided for cooking should be well screened. Retorts should be provided with vents to permit escape of air.

h. *Cooling.*—Cooling rooms should be used for this purpose only. They should be well screened and rat-proofed. The retort baskets should not be allowed to touch the floor. They should be suspended from the ceiling or allowed to rest on supports from the floor. The supports should be cleaned and sterilized before coming into contact with the baskets. If cooling platforms are used, they should be covered with metal, preferably noncorrosive, with all seams soldered. Low sides should be provided to prevent the crabs from falling from the platform. The surface of the cooling platform should be inclined slightly to permit thorough drainage. Crabs falling to the floor during the cooling process should not, under any circumstances, be replaced into retort baskets or on cooling platforms. They should be either reprocessed or thrown away.

i. *Picking and packing tables.*—Table tops should be covered with metal. Noncorrosive metal is recommended for covering tables. Concrete should not be used for table tops due to porosity, cracking, chipping, etc. Corroded or rusted table tops should not be used; tops should not be painted. Tables should be so constructed as to permit easy disposal of waste. They should be inclined slightly to provide for drainage. Tables next to walls should have the metal covering extend at least 10 inches above the table along the wall.

j. *Stools.*—Great care should be used to provide the proper type of stool or chair. Stools without backs are preferable to chairs, in that they are easier to clean and sterilize and also minimize hand contacts.

k. *Picking pans.*—These should be provided only for holding the 1-pound shipping cans during picking.

l. *Picking knives.*—These should be of one-piece construction, preferably of stainless steel.

m. *Blocks.*—Blocks used for cracking claws should be of smooth metal. Wooden blocks are not recommended.

n. *Cupboards or cabinets.*—These should be provided for storage of sterilized utensils when not in use. They should be constructed with screen doors and be provided with metal shelves.

## II. Operations.

a. *General cleanliness of plant.*—For sterlizing the equipment, either steam under pressure or a chlorine solution should be used. Steam, if available, is preferable to chlorine for sterlizing purposes. Before sterilizing the equipment, all particles of shell, meat, viscera, etc., should be removed with soap and water. If chlorine solution is used for sterilizing, it should contain from 100 to 200 parts per million of available chlorine. Directions for making this strength solution will be found on the containers in which the concentrated chlorine is sold.

1. When cleaning the cookers, all shell, crabs, and foreign matter should be removed. The cookers should be cleaned with water under pressure at the close of operations each day.

2. Cooling platforms and bins should be cleaned and sterilized before use and after each batch of cooked crabs is exhausted.
3. Shovels used for handling cooked crabs and ice should be used for these purposes only. They should be cleaned and sterilized before use and should not be allowed to touch the floor. When not in use they should be kept either on the cooling platform or in the ice bin. Separate shovels should be used for each purpose. It is highly recommended that the blades of the shovels be submerged in a chlorine solution when not in use.
4. Containers used for carrying cooked crabs to the pickers should be cleaned and sterilized at least three times a day.
5. Tables used for all purposes should be cleaned and sterilized before use. Picking tables should be washed and sterilized after the supply of cooked crabs of each picker is exhausted. Packing tables should be washed and sterilized at least three times a day.
6. Picking utensils, such as knives and pans, should be cleaned and sterilized after each lot of crabs in front of the picker is exhausted. Cans in which the meat is picked should be rinsed in chlorine solution before use.
7. Hand contacts with stools should be avoided. Stools should be cleaned and sterilized at the end of operations each day and before use the next day.
8. Facilities for washing the hands should be segregated from facilities provided for washing picking utensils. Separate lots of chlorine solution should be provided for rinsing the hands and sterilizing picking utensils. These solutions should be made up fresh at least three times a day.
9. Ice crushers, bins, and boxes should be cleaned and sterilized before use and also at the end of operations.
10. Floors should be kept free from waste and should be cleaned thoroughly at least once daily. Steam or water under pressure should be used in cleaning.

b. *Personal cleanliness.*

1. No person afflicted with any communicable disease should be employed in a crab-meat plant. Persons with wounds or sores on the hands should not be allowed to pick crab meat. Periodic check-ups should be made by health authorities or physicians and those persons in good health should be issued approved health certificates.
2. All persons employed in crab-meat plants should wear clean aprons and wearing apparel. Clean, washable caps or hair nets should be worn.
3. Before visiting the toilet, employees should remove aprons and leave them in the room where they are employed. Hands should be washed thoroughly with soap and water followed by a rinse in chlorine solution before starting work and after each absence from the picking room; also after each lot of crabs in front of the picker is exhausted. A person should be designated to see that this provision is strictly followed.

c. *Preparation of the meat.*

It should be stressed that crab meat, as prepared and shipped, should at all times be free from pollution.

1. Crabs should preferably be picked immediately, or as soon after cooking as is practicable. It is to be emphasized that cooked crabs which fall to the floor or otherwise come into contact with the floor should be either reprocessed or thrown away. If this precaution is not taken, the entire batch of crabs may become contaminated.
2. Crabs should be delivered to the picking tables by a person assigned to that duty. When trimmed crabs are washed for the purpose of removing fat prior to picking, the washing should be done with water under pressure. This should be done at a central point in the plant.
3. Crab meat should be picked directly into new and unused shipping cans in preference to picking pans. This will tend to reduce the number of hand contacts with the meat. The cans should rest in a clean pan while being filled. A person should be assigned the duty of collecting the cans from the pickers as they are filled. The nesting of cans one on top of the other at any time before delivery to the packing room should be avoided. Pickers should use greater care in picking the meat in order to minimize the amount of shell and cartilage in the meat.

4. After the filled cans are delivered to the packing room they should not be permitted to accumulate on the packing table. The practice of dumping the meat out of the can and picking it over to remove cartilage and shells is not recommended. Cans of crab meat should not be nested one on top of the other prior to packing in ice. If the meat is to be washed before icing, this should be done in the can by means of a sprinkling device or spray over a perforated table top or screen. The water used for this purpose should be free from pollution.
5. Crab meat should be iced promptly. The ice prior to crushing should be thoroughly washed on an elevated metal-covered platform. Barrels or ice chests should be thoroughly cleaned and sterilized before use and should be so perforated as to allow proper drainage.

d. *Disposal of waste.*

1. In front of each picker an opening should be provided in the table for the disposal of waste. A large metal container should be placed under each opening. This method will prevent the scattering of waste over the floor. Pickers should not empty these containers; this should be done by a person assigned to this duty. Containers should be washed thoroughly and sterilized each time they are emptied. In no instance should waste be allowed to remain in the containers overnight.
2. In localities where the waste is dried for use in fertilizer, provisions should be made for storage of this waste at the plant. It should be stored in concrete or wooden metal-lined bins which are under cover outside the plant and which are adequately protected from flies and vermin. Waste should be removed at least once a day and should not be allowed to remain in the bin overnight. The bins should be thoroughly cleaned and disinfected after removal of the waste.
3. If drying facilities are not available, waste should be stored as above and disposed of daily by dumping into deep water where there is sufficient current to scatter the waste, or perhaps a more satisfactory disposal should be made of the waste by its use as a fertilizer by local farmers, unless sufficient quantities of waste are available for mechanical reduction.

NOTE.—It is suggested that a competent person be employed at each plant to see that these recommendations are carried out. He should supervise the washing of hands and equipment and be generally on the alert to correct any insanitary conditions that may occur.

### PREPARATION OF FRESH OYSTERS

This study was continued during the past year through the use of additional funds obtained by the Division at the instance of members of the oyster-packing industry. A temporary field laboratory was established in the City Hall at Norfolk, Va., through the cooperation of the city health authorities. Technologists stationed at this laboratory made an extended study of commercial practices in the local oyster-packing plants and aboard oyster-fishing boats, and of the condition of oysters as found on the growing beds in that vicinity. One of the primary purposes of this study has been to determine the type of organism responsible for pink discoloration of certain shipments of oysters, and its prevalence. It was found to be an organism commonly known as "pink yeast," and that it was present in fairly large numbers in the mud on the oyster beds and on the equipment on the boats and in the packing plants. The best way to check the spread of this yeast is to wash contaminated equipment thoroughly with fresh water and then spray with a 3 percent solution of formaldehyde.

A survey of oyster-packing plants operating on the North Atlantic seaboard was made for the purpose of obtaining data on the commercial handling of oysters, and technique for maintaining the plants in a sanitary condition. As a result of this work a sanitary code for the handling of fresh oysters was prepared and presented to the oyster packers at the 1940 annual meeting of the Association of Oyster Growers and Dealers of North America. This code is similar to that for the packing of fresh crab meat which appears on pages 213 to 216 of this report.

Toward the end of the year, the equipment at Norfolk was transferred to the College Park (Md.) Laboratory. Here the following phases of this problem are being considered and will be reported later: (1) Incidence of the pink yeast in fresh, commercially shucked oysters; (2) effect of various chemicals as germicides specific for the pink organism; (3) continuation of the studies on changes in hydrogen-ion concentration (pH) as oysters age, as a possible test for judging quality; (4) effect of washing and blowing on the mineral content of oysters; and (5) studies on containers for packaging oysters.

### HANDLING OF FRESH FISH ABOARD FISHING VESSELS AND AT PACKING PLANTS

In recent years difficulties have been experienced in maintaining the quality of fish caught by the large otter trawlers operating from New England ports and handled on the Boston Fish Pier. From time to time, these difficulties have resulted in considerable financial loss to wholesale dealers. As a result, the Massachusetts Fisheries Association, Boston, Mass., and the Fishery Advisory Committee of the Department of the Interior requested the Bureau of Fisheries to conduct studies of this problem in order to recommend changes or improvements in existing methods which would result in the marketing of a product of higher quality. This problem was studied during the summer and fall of 1939.

Investigators accompanied the otter trawlers to observe the actual commercial methods for the capture of the fish and for handling them aboard the trawler. Information was obtained especially on the temperatures of the waters wherein the fish were caught; temperatures of the fresh-caught fish, and of the fish as stored in the hold; effect of the pressure on the various layers of fish as packed in the storage pens; effect of sanitary measures in retarding deterioration of the stored fish; and the applicability of the electrometric test for judging the quality of the stored fish. Studies also were made of the practices used in unloading the catch at the Boston Fish Pier and of the handling of the fish in the packing plants.

Methods for eliminating the use of pitchforks aboard vessels have been suggested by the investigators. These also include suggestions made by previous investigators and cover the use of wire-bladed (potato) shovels for moving fish from one place to another on the vessel, a basket arrangement in the washing boxes on deck which can be raised and tipped to slide the fish from the boxes, and a chute leading from the washing boxes for lowering the fish to the pens in the hold.

Methods suggested for eliminating the use of pitchforks in the unloading process include: (1) Substituting wooden rakes for pitchforks in removing the fish from the pens to the unloading baskets; (2) discharging the fish from the baskets to a weighing box fitted with a trapdoor at one end; (3) placing the weighing box on a raised platform on the pier; and (4) removing the fish from the weighing box to a cart by tipping the box at such an angle that the fish slide through the trapdoor into the cart.

It was found that the pens in the hold of vessels having mechanical refrigeration are constructed in such a manner that cold air cannot circulate around them. Thus the fish in the topmost layers may be frozen upon arrival at port, while the lower layers remain at a temperature conducive to rapid deterioration. To overcome this, the investigators suggested that the pens be so constructed as to allow an open space of about 2 inches around all sides of each individual pen.

It was found that one of the major factors contributing to deterioration of the fish is the physical damage from punctures made in the flesh by the use of pitchforks in handling the fish aboard vessels, in unloading at the pier, and, in some instances, in the packing plants. Physical damage also is caused by the pressure of large pieces of ice which bruise and rupture the flesh when fish are stored on the vessel in deep pens, or bins. This pressure was found to be as high as 2.5 pounds per square inch on the bottom layer of fish in a pen 5 feet deep. Bacterial contamination of the flesh is made easily possible through the ruptures and bruises caused by these practices. In pens 30 inches deep, the pressure on the lower layer was 1 pound per square inch and bruising was not excessive. It appears, therefore, that the storage pens should be as shallow as possible and that finely crushed ice should be used for refrigeration of the fish while in the pens.

Studies on handling the fish in the packing plants reveal the need for instituting improved sanitary practices. Toward this end, the investigators prepared a set of suggestions which was distributed among the owners of the packing plants. These suggestions are similar to those for the crab-packing plants as outlined on pp. 213 to 216 of this report.

During recent years some of the fish-packing firms in New England have been candling fish fillets to detect those which are unmarketable. The method used in Boston caused considerable glare, and resulted in eyestrain to the inspectors. Attempts were made to remedy this situation by polarizing the light for the candling operation. This proved successful in reducing the glare, but costs for general installation are somewhat high. A partial solution of the problem could be obtained by exposing a smaller illuminated area, thus reducing or entirely eliminating the stray light around the fillets. Special types of light bulbs which minimize glare also may be an aid in this connection. A detailed report of this study is now being prepared by the investigators.

### ULTRAVIOLET RAYS IN KILLING BACTERIA

The work on this problem during the past year has been concerned with establishing the effects of intermittent irradiation on the keeping quality of haddock fillets stored under refrigerated conditions. The purpose of this work is to determine whether it would be possible to reduce bacterial contamination in fish while being prepared in the fish processing plants and while being held in cold-storage warehouses and retail display cases, by the use of ultraviolet lamps. A mechanical device, developed by the research workers at the College Park Laboratory, allowed a 30-second exposure of fish fillets to the rays of the ultraviolet lamps for each hour of storage in the experimental refrigerator. At 48-hour intervals during a total storage period of

8 days, samples of the fillets were withdrawn from the experimental and control refrigerators to determine comparative bacteriological counts, and for chemical and organoleptic tests. The results obtained thus far indicate: (1) Bacterial numbers were appreciably lower for the intermittently irradiated than for the nonirradiated control fillets stored under similar conditions of time and temperature (8° C. (46° F.)); (2) cellophane apparently permitted the passage of the ultraviolet rays to the surface of the haddock fillets wrapped in this material; (3) organoleptic tests of the irradiated and control haddock fillets indicated that the irradiated fillets were superior in flavor to the nonirradiated control fillets stored under similar conditions of time and temperature; and (4) this method of intermittent irradiation has commercial possibilities in prolonging the keeping qualities of haddock fillets during storage, especially in display cases or other glass-topped refrigerators as used in retail stores. It probably has similar application in prolonging the keeping qualities of other nonoily fish in storage. As time permits, certain other phases of this investigation which need verification will be made.

## PREPARATION AND PACKAGING OF FRESH FISH

During the past year a study was initiated at the laboratory in Washington, D. C., on improvements in methods for the preparation and packaging of fresh fish. Results obtained to date indicate that the addition of preservatives to ice, such as sodium benzoate, are not effective in increasing the length of time during which the fish will remain in good condition. Preservatives added to brine dips do accomplish this purpose, but not in the lowest concentrations; or when the fish is given a very short dip. A plain salt solution is useful as a preservative measure for fresh pan-dressed or filleted fish, when the brine tests 50° salinometer and the dip is 15 minutes. The addition of organic acids to brine dips shows a slight improvement in keeping qualities.

From the standpoint of packaging and preparation, vegetable parchment paper wrappers are more satisfactory than wrappers of the cellophane type, but the retail customer seems to prefer the latter. Experiments with individual hermetically sealed No. 2 tin containers (19 oz.) for fresh fillets and fresh pan-dressed fish were not satisfactory. Fibreboard containers of about 1-pound size with slip cover tops were an improvement in the packaging of fresh pan-dressed fish, but not with fresh fillets.

Conclusions from a previous study that pan-dressing and brine-chilling improved the quality and increased the length of preservation, were confirmed. It was also found that while pan-dressing or brine-chilling were most effective at the point of production, a slight improvement was noted when this was done at the point of distribution.

Work in filleting and dressing various species of fish of the South Atlantic area indicates that these varieties, with the exception of the butterfish and possibly the spot, are suitable for filleting in sizes above one-half pound, round weight. Fish smaller than one-half pound were best prepared by pan-dressing.

## FREEZING PACKAGED SALMON AND FLOUNDERS FOR SUBSEQUENT STORAGE IN REFRIGERATED LOCKERS

Salmon has long been the most important species of fish taken on the Pacific coast. Although the greater proportion of the catch is canned, considerable quantities also are sold fresh, frozen, salted, and smoked. Pacific salmon normally are frozen in the round in sharp freezers and distributed in this manner. During the past several years, however, an effort has been made to develop a market for frozen salmon products in packaged form.

For several years there has been a marked development in otter-trawl fishing in the Pacific Northwest, particularly on Puget Sound. This has led to an increased catch of flounders and other small bottom-fish which has created a supply of low-priced fish available for preparation as packaged, frozen products.

A market for packaged salmon and flounders seems possible through the development of the refrigerated locker industry. This industry is particularly beneficial to those who, owing to their geographical location, find it difficult to obtain sea foods during certain seasons of the year. Now, with the refrigerated-locker system, it is possible for them to obtain these foods during seasons of quantity production and store them until needed. In rural communities these lockers consist of self-contained units for installation on the farm. In many small towns and cities the locker is placed in a regular community cold-storage warehouse. These lockers, ranging in size from 8 to 12 cubic feet capacity, can be leased at prices ranging from 75 cents to $1 per cubic foot per year. All facilities for freezing and preparing sea foods for storage are usually supplied by the operators of the community locker establishment.

In view of the need for information regarding the problems associated with the freezing of salmon and flounders for subsequent storage in refrigerated lockers, the Bureau has undertaken studies of this nature. The program of research is initially concerned with a survey of some of the practical aspects of freezing and storage based on existing commercial facilities on the Pacific coast, with particular attention to the significance of brining, method of packaging and type of wrappers, "quick" freezing versus "sharp" freezing, and temperature of storage. Observations are being made to evaluate drip, dehydration, discoloration, texture, rancidity, and the effects of possible transfer of odors between sea foods and other products stored in the same locker.

While these investigations have not as yet reached a point where it is possible to draw definite conclusions, the data obtained indicate that a latex composition bag furnishes the most efficient protection from evaporation of moisture, and that there is no transfer of odors from frozen sea foods to other foods stored in the same locker.

Additional information obtained suggests the use of chemical treatment (brine dip) as a method for minimizing drip of the stored fish. While storage temperature has some effect on drip, the rate of freezing seems to be of less importance; at least in the early stages of storage.

Storage temperature seems to be the most important factor influencing the color of the flesh. The use of the brine treatment, which minimizes drip, has an adverse effect on color, but it is not as pronounced as the effect of storage temperatures.

Storage temperature also is an important factor in controlling rancidity, and the brine treatment so far has had less adverse effect in this connection than had been anticipated.

### COMPOSITION OF COMMERCIAL SPECIES TAKEN ON THE PACIFIC COAST

Studies relating to the amount of wastage occurring during dressing, and the approximate chemical composition of the edible portions of the various species of food fish landed in Seattle by the commercial fishing fleet, discussed in last year's report, were completed during the year. The data have been tabulated and are being submitted, with a brief discussion, for publication. Information of this type has distinct practical value since it will inform fishermen, fish dealers, and housewives regarding the wastage occurring in preparing fish for market or for the table as dressed fish or packaged fish and will indicate the percentage of edible food material and its approximate food value.

### CANNING AQUATIC PRODUCTS

During 1939 a study of commercial methods now used in the canning of fish was completed, together with a compilation of the principles governing these methods. Data were obtained on cannery construction, on the manufacture of glass and tin containers, wood and fibre cases, on the operation of canning machinery, sanitation in canning, spoilage in canned fishery products, methods used in the examination of canned fishery products, and cannery inspection. Flow sheets and charts have been prepared illustrating the preparation of almost every type of commercially canned fishery product. The results of this study have been prepared for publication.

Studies on the canning of the blue crab were completed. Packs were made at different seasons of the year to determine the effect of seasonal variation, and were processed at various pressures to determine the relation of process to discoloration. A number of packs canned previously, which had been in storage for varying periods of time—some up to 18 months—were examined and their condition noted. A report on the studies dealing with this research has been prepared and submitted for publication. It is believed that the method developed by the Bureau is commercially practicable, and if followed carefully a canned crab meat of good quality should be obtained by the packer.

One new study on the canning of fishery products was undertaken during the year. This had to do with the preparation of fish pastes, or sandwich spreads. In view of the fact that considerable quantities of such products are imported into this country, local manufacturers have manifested an interest in the production of these products, especially adapted to the American taste, and the Bureau has been called upon for assistance in this direction. A series of pastes were prepared from bloaters, crabs, shrimp, hard smoked herring, salmon, salmon and shrimp combined, smoked salmon, sardine, and tuna. Following an incubation period to determine which methods of preparation were successful, a report on this work will be prepared.

## DEVELOPMENT OF TESTS FOR DETERMINING THE QUALITY OF FISH

During recent years there has been evidenced a need for the development of chemical and bacteriological tests as contrasted to organoleptic tests for determining the quality of fish. This has been occasioned by the desire of the fishery industry for control of quality at all stages in the production and marketing processes, so that the consumer may purchase a product of uniformly high quality. Moreover, there is a need for the industry to meet the requirements of the new food and drug regulations. Such tests also would be needed in an inspection and grading service for the fishery industry, such as has been under consideration in Congress during the past year, if the products handled and marketed are to be judged for quality on an impartial basis. In order to solve these problems, the Bureau during past years has conducted, and is continuing to conduct, considerable technological research on practical tests for quality which can be applied under commercial conditions. Mention has been previously made in this report of such tests for the quality of fresh crab meat and shucked fresh oysters. Following is a brief summary of the past year's progress in developing tests which properly identify the quality of fish under various types of preservation and having varying initial degrees of freshness.

### FORMATION OF LACTIC ACID AND ACTION OF ENZYMES AS INDICES OF RELATIVE FRESHNESS OF FROZEN FISH

One of the principal indications of strictly fresh fish is the stiffness of the muscle tissue due to rigor mortis. This condition is accompanied by the development of a high lactic acid content in the flesh of the fish. The development of lactic acid progresses to a maximum in a period varying from 24 to 36 hours, then gradually diminishes until it has completely disappeared. This study was inaugurated for the purpose of observing whether there was a correlation between the lactic acid content of fish flesh and the relative freshness of the fish during periods of storage after freezing. If it can be established that there is a correlation between relative freshness and amount of lactic acid present, it will be possible to make use of this determination for the grading of fish as to quality. Early in the course of this study it was found that it would be necessary to divide the problem into three phases: First, a study of the development and gradual disappearance of lactic acid in the fish flesh; second, the effect of enzymes produced by bacteria which utilizes the flesh of the fish as a medium for growth; and third, the effect of the action of autolytic proteolytic enzymes contained in the flesh of the fish.

*Lactic acid.*—Information obtained thus far on this phase of the study indicates that the lactic acid content of the flesh of sea trout and striped bass was 0.60 percent at death, or in rigor mortis, and about 0.40 percent after 50 days in cold storage. Flesh of these fish kept on ice for 3 days showed a lactic acid content of about 0.40 percent, which decreased after 50 days in cold storage to 0.35 percent. The lactic acid content of the same kind of fish flesh kept without ice for 3 days dropped to 0.12 percent and showed no further change during 50 days in cold storage. It seems likely, therefore, that this reaction may be used as a test for judging the quality of fish, especially when frozen.

*Bacterial enzymes.*—The study of this phase of the problem, dealing with the effect of bacterial enzymes on the keeping quality of frozen fish, has not reached a point where any conclusions can be stated.

*Autolytic proteolytic enzymes.*—The information thus far assembled on this phase of the study indicates that there may be a direct correlation between the age of the fish; that is, whether the fish is one, two, or three or more years old when caught, and the rate of enzyme reaction in the flesh. It appears that the enzymes in the older fish react more slowly than those in the younger fish and, therefore, the older fish can be held in cold storage over considerably longer periods of time without appreciable deterioration from this reaction. The study has not progressed far enough to confirm this assumption. There does, however, appear to be a strong indication that there is a correlation between the age of the fish and the period of time frozen fish may be kept in good condition in storage.

### TESTS FOR MEASURING DETERIORATION OF FRESH SALMON

As has been indicated previously, the quality of fresh or preserved fishery products is influenced largely by the conditions of handling prior to sale or preservation and the effectiveness of the methods of preservation used. In order to control the changes taking place in a product as perishable as fresh salmon, and thus improve handling or preservative methods which will lead to preparing products of higher quality, knowledge of the nature of its deterioration and means of measuring the degree of such deterioration quantitatively are helpful.

While several recent publications have suggested tests for measuring deterioration in salmon after canning, very little scientific attention has been given to development of tests for measuring deterioration of salmon while in the fresh condition prior to canning. Accordingly, studies of this nature were inaugurated during the past year. The preliminary work which is now in progress pertains to the significance of bacterial counts, content of ammonia, trimethylamine, volatile acids, volatile alcohols, and hydrogen sulfide; and decrease in the buffering action of the flesh as indices of deterioration indicative and descriptive of the nature of the changes taking place in salmon during storage at high temperature, that is, approximately 70° F., and at low temperature of about 32° F., in ice. At the time this report was prepared this work had not progressed sufficiently to permit reporting conclusions.

### IDENTIFICATION OF CANNED SALMON

In previous reports we have discussed briefly the possible use of the refractive index of the free oil in canned salmon as an aid in identifying the species in the can. Data obtained from a respresentative sampling of the entire Pacific coast and Alaska salmon packs for 1936 and 1938 are summarized in the following table. While it is evident that the overlapping of the values for each species precludes the use of refractive index of free oil as a positive method for identification, the mean values and the standard deviations suggest the utility of the method for supplementing existing criteria. No further sampling is contemplated for the near future, but as time permits the data at hand will be subjected to detailed statistical analysis to determine the extent to which the method can be used.

*Refractive index of free oil in canned salmon*

| Species | Year of pack | Number of samples | Refractive index | | |
|---|---|---|---|---|---|
| | | | Range | Mean | Standard deviation |
| Chinook or king | 1936 | 109 | 1.4693–1.4743 | 1.47159 | 0.00101 |
| | 1938 | 77 | 1.4698–1.4753 | 1.47178 | .00109 |
| Red or sockeye | 1936 | 275 | 1.4705–1.4768 | 1.47328 | .00104 |
| | 1938 | 225 | 1.4710–1.4773 | 1.47475 | .00116 |
| Chum or keta | 1936 | 104 | 1.4720–1.4766 | 1.47444 | .00090 |
| | 1938 | 103 | 1.4734–1.4771 | 1.47489 | .00068 |
| Silver and coho | 1936 | 125 | 1.4718–1.4787 | 1.47584 | .00089 |
| | 1938 | 113 | 1.4744–1.4788 | 1.47665 | .00074 |
| Pink or humpback | 1936 | 186 | 1.4707–1.4789 | 1.47634 | .00126 |
| | 1938 | 152 | 1.4750–1.4796 | 1.47718 | .00101 |

### CHANGES IN THE COMPOSITION OF PINK SALMON (*Oncorhynchus gorbuscha*)

The commercial fishery for salmon is predicated upon the natural instinct of these fish to return to their parent streams to spawn and die. During the course of the spawning migration, the fish undergo considerable physical change and have been assumed to become poorer in quality, inasmuch as there is a gradual decrease in the pigmentation and firmness of the flesh and a definite diminution of the fat content of the edible portion of the carcass.

In last year's report reference was made to chemical analyses of the flesh of pink salmon which indicated that, from a chemical standpoint, the pronounced changes in physical appearance were accompanied by much less change in the nature and composition of the flesh protein. During the past year feeding tests were made with extracted pink salmon flesh which substantiate the chemical tests in that there appeared to be no significant difference in the nutritive value of the extracted flesh of early- and late-caught fish despite the marked difference in physical appearance. A final report incorporating and discussing the various chemical and biological data is nearing completion and will be submitted for publication shortly.

### PEROXIDE TEST AS A MEASURE OF OXIDATIVE DETERIORATION OF FISH OIL

Several years ago a study was begun on the development of rancidity in the oil of fatty fish held under varying conditions of storage. The criterion of rancidity had been the Wheeler test for peroxide formation. Further investigations of this general nature were planned but it was thought advisable to make a preliminary study of the various tests of rancidity, as to the type of rancidity each test indicated, and the relation of the various tests to each other and to that ultimate criterion of rancidity—the organoleptic test which, unfortunately, is not easily capable of quantitative determination.

A study of four methods for testing rancidity was begun, therefore, during the past year. Measurement of oxygen absorption as an estimation of the degree of rancidity was tried and discarded as impracticable. The Shibsted test for fat aldehyde was then applied to a number of fresh oils. Wheeler peroxide values on the same oils showed no correlation whatever to the Shibsted values. A group of measured samples was also exposed to sunlight and air and the accelerated rate of rancidity was followed by the Wheeler peroxide test and also by a modification of the Wheeler test, suggested by another chemist of the Bureau of Fisheries for the purpose of a more complete estimate of the peroxide content of rancid oils.

As an outcome of this series of tests three further series of accelerated rancidity tests were set up using the same tests on different types of fish oils; body, liver, and viscera oils at all stages of the development of rancidity. Very interesting data have been obtained which permit the development of several new hypotheses concerning the formation and determination of peroxides in oils. The data show that the peroxide determination methods tested do not indicate the time values and cannot be correlated with rancidity formation in the various oils. More work is necessary before any one test, or group of tests can be intelligently interpreted to the determination of the rancidity of the oil in the flesh of samples of frozen fish.

## TREATMENTS TO RETARD DETERIORATION OF FISHERY PRODUCTS

### ANTIOXIDANTS

Under an industrial fellowship sponsored by the Musher Foundation of New York, studies were continued during most of the past year on the use of antioxidants in retarding the deterioration of fishery products.

The first phase of the problem dealt with preventing oxidation of oil, and with inhibiting protein decomposition, in frozen mackerel and haddock fillets during extended storage by the use of the following antioxidants: Oat flour, water extract of oat flour, and ice made from the water extract of oat flour. The resulting data indicate that fresh fillets dipped in the water extract of oat flour before freezing and storage changed less in cold storage than the controls. Dusting the fresh fillets with oat flour prior to freezing was less effective. Storing fresh fillets in ice made from the water extract of oat flour showed no advantage over storing them in ordinary water ice.

The second phase dealt with the use of an antioxidant mixture "Carblex" composed of glucose and lecithin in maintaining vitamin A potency by decreasing oxidation in cod-liver oil, particularly after the sealed containers are opened for household use. The addition of small amounts of Carblex appeared to be effective in this connection, but its use for this purpose is not recommended in view of a ruling of the United States Food and Drug Administration relative to the addition of preservative substances to food or medicinal products.

The third phase dealt with the addition of Carblex to raw menhaden prior to manufacture into meal and oil to determine whether it would reduce oxidation of the resultant products. A positive effect was observed in the rendered oil, but the finished meal showed generally negative results, since the heating process apparently had an antioxidant effect in itself. The phospholipids of the flesh appeared to be the naturally occurring antioxidants. In general, the addition of Carblex to the raw menhaden did decrease the rate of oxidation in the resultant oils and in some instances inhibited protein decomposition in the meal, but pilot plant studies will be necessary before the laboratory techniques can be applied to commercial practice, especially to determine optimum amounts of the Carblex to add to the raw material and the best way to incorporate it. The above three phases of this study were conducted at the College Park (Md.) Laboratory.

Additional studies on the use of antioxidants for retarding deterioration of fishery products taken on the Pacific coast were continued at the Seattle (Wash.) Laboratory, also under the sponsorship of the Musher Foundation of New York. Here attention was given to the effectiveness of the various types of water extracts of oat flour, "Avenized" salt (a mixture of oat flour and salt), and Carblex in retarding oxidation of frozen or mild-cured salmon. It appears from this work that the water extracts and the mixtures of oat flour showed little effectiveness in improving the keeping quality of frozen salmon. However, brine containing the water extract of oat flour was found to retard protein and oil decomposition of mild-cured salmon to some extent.

### CHEMICAL PRESERVATIVES

During most of the year three industrial fellows were maintained at the College Park Laboratory by the Aquacide Company of Washington, D. C. The research has dealt mainly with the development of chemical preservatives, both liquid and dry powder, for the preservation of fish bait and of fish livers prior to extraction of oil. Trials under practical conditions have shown that properly preserved livers could be held for weeks or even months without refrigeration and still yield a medicinal grade of oil.

A chemically treated fillet wrapper has also been developed which improves the quality and prolongs the keeping time of freshly cut fish fillets. In commercial practice, the coated wrapper has promise of eliminating the need for brine tanks and permitting more sanitary handling of fillets.

These fellowships were discontinued by the sponsors on December 31, 1939. The results of the investigations conducted by the industrial fellows assigned to these problems are being assembled for publication.

## MANUFACTURE OF FISHERY BYPRODUCTS

Studies in this field cover the utilization of the various byproducts of the fisheries, and methods for testing and improving their quality.

### UTILIZATION OF SALMON CANNERY TRIMMINGS

Because of the potential economic value of salmon-cannery trimmings now being discarded in Alaska, the Bureau has continued its studies to determine means for attaining more complete utilization of these materials. During the year Fishery Investigational Report No. 40, "Pacific Salmon Oils" was published and the information contained therein was made available to the public. This report supples data regarding the chemical and physical properties of salmon oils, which are suggestive of their utility for technical consumption, and demonstrates conclusively the value of salmon oils as sources of vitamins A and D. It is significant that during the year a quantity of Alaska salmon oil was, for the first time to our knowledge, sold in commercial quantity on the basis of its vitamin potency.

The value of the Bureau's investigations on salmon-cannery trimmings becomes more in evidence with each passing year, as waste utilization becomes more general and as the monetary return to the industry increases. Several years ago our technologists developed methods for producing high quality, edible salmon oils which could be incorporated in canned salmon, thus adding increased nutritive value to the canned product and leading to greater uniformity of the pack. This method of utilizing the edible portion of the trimmings has become universal practice on the Columbia River and is beginning to be adopted more generally throughout the salmon canning industry. The Bureau's work has brought about a new development in salmon canning methods which gives a product which is preferred in the more critical canned-salmon markets.

During the past several years the trend in vitamin oil consumption has been toward more concentrated products. The Bureau's studies have demonstrated that the visceral portions of the trimmings are a more potent source of vitamins than the body trimmings. Since the preparation of canning oil requires separation of the edible body trimmings from the visceral parts, the latter materials become available for utilization in the manufacture of special vitamin products of greater potency. Our studies on salmon trimmings have demonstrated that oils prepared from total cannery waste normally equal and frequently exceed poultry grades of cod liver oil as sources of vitamin D. However, in view of the above-mentioned trend toward the consumption of more concentrated sources of vitamins, it has become necessary to determine whether it would lead to greater monetary return to the industry to recover a greater total amount of vitamin in total waste oils or to recover a lesser total amount of vitamins in the manufacture of the more concentrated visceral oils. Studies of this nature are in progress. Attention is being given also to the study of equipment suitable for handling small quantities of waste which cannot be accumulated at a central reduction plant.

## UTILIZATION OF FISH LIVERS AND VISCERAL ORGANS

In last year's report reference was made to a general survey being conducted to determine the potential value of the liver and viscera from the various species of food fish on the Pacific coast. All work contemplated on this project for the present has been completed, and the data are being tabulated for publication.

## PREPARATION OF FISH MEALS OF IMPROVED NUTRITIVE VALUE

During the year the work mentioned in last year's report dealing with the preparation of special dehydrated fish foods was continued in cooperation with the Bureau's Division of Fish Culture and the University of Washington School of Fisheries. The results demonstrate the practicability of conserving special nutritive properties in dehydrated fish waste materials by low-temperature drying without prior removal of water-soluble extractives. Further work on the preparation of fish meals of improved nutritional value is being carried on in connection with the utilization of salmon cannery trimmings where attention is being directed to the possibility of preparing dehydrated products especially high in vitamins A and D, and in riboflavin content.

## STORAGE OF FISH MEAL

As discussed in last year's report, the tendency for the so-called fatty fish meals, that is, those prepared from such fish as pilchard, menhaden, salmon, and herring, to heat spontaneously immediately following manufacture and during subsequent storage presents one of the most aggravating problems of the fishery byproducts industry. The spontaneous heating of fish meal necessitates precautionary handling procedures which increase cost of operation, frequently results in a decrease in the quality of the meal, and occasionally causes complete loss due to spontaneous combustion.

During the past year studies have been carried on which demonstrate that air- and moisture-proof containers, such as multiwall paper bags with asphalt-treated liners, prevent spontaneous oxidative heating in fish meal without necessity of the usual precautionary handling methods. The multiwall paper containers have the additional advantages of resisting insect infestation, preventing sifting of the meal during storage and shipment, and practically eliminating the fish meal odor of the package. These factors could possibly result in obtaining lower transportation rates for fish-meal shipments so packed.

After 12 months' storage the only disadvantages of the paper containers appeared to be their greater fragility as compared with the burlap bag and a very slight increase in the caking of the meal. Tests are now underway to determine the upper limit of moisture content permissible in meal if it is to be stored in this moisture-proof type of container. Should the test results continue as encouraging as those obtained to date, and this type of container be adopted by the industry, a considerable market would be developed for a domestic paper product in place of imported burlap.

## OXIDATION OF FAT IN FISH MEAL

These studies deal with determining the factors affecting the oxidation of fats in fish meal under various conditions of processing and storage. However, a fundamental attack on the chemistry of fat in fish meal had to be pursued in order to get needed information before undertaking the more practical aspects of the problem.

A preliminary study was made with mixtures of solvents in order to obtain complete extraction of oils irrespective of degree of oxidation. Certain of the resulting data indicate that exposing the meals to light and conditions of elevated temperature and moisture produces an appreciable oxidation in the constitutive fats or oils. A determination of the iodine numbers of some samples of menhaden oil clearly indicates that oxidation of the fish oil takes place more rapidly when isolated from the meal. A protein-fat complex in the meal apparently acts as a natural antioxidant. Pharmacological studies are also being carried out with fractions of oils isolated from the various fish meals.

A second study regarding the determination of fat in fish meal was continued during the year as time permitted. Much useful data has been obtained relative to (a), the effectiveness of various solvents and solvent combinations; (b), the relation of different conditions of fish-meal manufacture and storage to change in the solubility of the fat; and (c), the possibility of differentiating between altered and unaltered fat as a means of evaluating the condition of the fat in the meal.

### SOLUBILITY OF FISH PROTEINS

In the normal reduction of fatty fish and fish waste in the manufacture of fish meal and fish oil, approximately 20 percent of the original solid materials passes into solution and is discarded with the waste waters. Because of the importance of this loss, both from the standpoint of economical operation and conservation of raw materials, the Bureau has begun a study of the solubility of fish proteins during cooking in order to determine the possibility of treatment which would decrease the amount of material passing into solution.

### NUTRITIVE VALUE OF AQUATIC PRODUCTS

Studies on the nutritive value of aquatic products have always occupied an important place in the Bureau's technological investigations because the nutritive value of a finished product ready for marketing is in most instances the true yardstick or measure of the value of a new method of processing or an improvement in existing methods in the industry. For example—assuming that costs of processing are equal in each case—if a new method of manufacturing fish meal or a new method of freezing fish fillets produces a finished product of better quality, measured in terms of food value, then that is a true estimate of its worth, or justification for its commercial application.

The problems undertaken in this field during the past year have been concentrated on determination of the nutritive value of the edible portion of fishery products, more particularly the biological value of the protein. Considerable effort has also been expended on evaluation of the feeding value of fish meals and a study of changes resulting from conditions of processing and storage.

Study also was made of the biological value of the protein of salmon taken under different physiological periods, such as prior to migration, during migration, and during spawning. Acute and chronic toxicity tests with certain kelp products, Irish moss, and agar, have also been carried out by an industrial fellowship.

### NUTRITIVE VALUE OF PROTEINS OF CERTAIN SHELLFISH

Studies were conducted to determine the nutritive value of the protein from the edible portion of various species of shellfish. Adult rats were fed known amounts of the various proteins and the quantity used for maintenance was determined in metabolism trials. All of the proteins were well digested.

On the basis of 100 representing complete utilization for maintenance, the protein of beef round (control) scored 70; of white meat from blue crab, 74; of shrimp, 77; and for the Eastern oyster the comparative score was 90. These data corroborate the previously reported findings that the proteins from fishery products are superior to beef round in promoting growth.

### NUTRITIVE VALUE OF ALGINATES FROM KELP

An industrial fellowship was sponsored by the Kelco Corporation, San Diego, Calif., to conduct certain biochemical and pharmacological studies of the nutritive value of products derived from the seaweed commonly known as kelp (*Macrocystis pyrifera*). One of these problems was to study the nutritive value of an algin product known as "Dariloid." This is a sodiumphosphoalginate with added sugar and dextrin to render the product soluble in milk with a uniform colloidal strength. It is used as a stabilizer in ice cream, chocolate milk, and other food products.

At the close of a series of feeding experiments extending over a 10-week period the data showed that the rats fed the substituted basal diet containing 5 and 10 percent of Dariloid (20 and 40 times the recommended additions to ice cream) were no different in appearance and grew approximately as well as the control rats fed the basal diet. The rats fed diets containing 20 and 30 percent of Dariloid (80 and 120 times the recommended additions) did not grow quite as well but showed no gross symptoms of toxicity either by external appearance or at necropsy. A few rats died early in the test period but no characteristic changes could be discerned at necropsy. The algin did not serve as roughage alone but was digested in increasing amounts in the diets containing the higher levels.

The rats fed the 5 and 10 percent levels were continued on the substituted basal diet containing 5 percent of Dariloid. These rats showed no symptoms of chronic toxicity after a period of 10 months, and the live weights were about equal to those of the controls. Comparable experiments were carried out with sodiumalginate "Kelgin" and approximately similar results were obtained when calculated to equivalent alginate content.

Feeding studies also showed that Irish moss and agar have considerable nutritive value. These data are being summarized for publication.

### KELP MEAL IN ANIMAL FEEDING

Several years ago a cooperative project was inaugurated between this Bureau and the Dairy Departments of the University of Maryland and of the State Agricultural Experiment Station at College Park, Md., in which it was hoped to determine whether kelp meal could be used as a supplement in the diet of dairy cattle for improving reproduction. This study is being continued with producing or lactating dairy cows on a more extensive scale, and it is believed that information of considerable interest and benefit to both the dairy industry and to the producers of seaweed meals will result from these experiments. It is generally understood that tests of this kind with large farm animals, such as dairy cows, require several years for the production of conclusive results. Up to the present time, however, quite definite improvements in the reproduction records of the animals fed kelp meal have been noted.

### POSSIBLE TOXIC PROPERTIES OF CERTAIN FISH MEALS

Last year studies were begun to determine the feeding value of several fish meals which were stored under unfavorable conditions of high humidity and heat. Pilchard meal, a type of white meal made from various kinds of ground fish, and menhaden meal were tested.

Chicks were used largely as test animals and were fed diets in which the various experimental fish meals supplied nearly all of the protein. The data obtained on this experiment indicate that chicks could be grown satisfactorily to an age of at least 7 weeks on the diets which contained 30 to 35 percent of this experimental meal. In fact, the protein of this meal was found to have a high nutritive value and under some conditions the exposure of meals to high humidity and heat markedly increased the vitamin K content and some vitamins of the B complex through bacterial action.

The data also showed that any subnormal growth in chicks fed diets incorporating the experimental meals was due to a deficiency state rather than any toxicosis caused by some protein or fat decomposition product. This finding is very important in actual practice, since it means that fish meals may be freely incorporated in the rations of farm animals for their valuable protein and mineral content, provided reasonable care is taken to balance the rations for all other food elements by a proper selection of cereals and leafy legumes.

The results obtained in this study have been prepared for publication under the title "Studies on the Feeding Value of Fish Meals: Effect of Heat and Moisture on Protein." It is planned to continue these studies to obtain further data relative to the development of vitamin K and the vitamin B complex in the experimental meals.

## FLUORINE IN FISHERY PRODUCTS

These studies were completed and the results as outlined in last year's annual report were published as Fishery Investigational Report No. 44, "Study of the Metabolism of Naturally Occurring Fluorine in Canned Salmon and Mackerel." The conclusions derived from the study were: (1) Inorganic fluorine is three times as effective in producing defects of tooth enamel as is naturally occurring fluorine from canned salmon and mackerel; and (2) all of the fluorine ingested from the basal diet, and 67 percent of the added inorganic fluorine is stored in the body of the rat. Only 21 percent of the fluorine from the canned salmon or mackerel is stored, indicating that the naturally occurring fluorine from these fish is stored at only about one-third of the rate of added inorganic fluorides. Under practical conditions no toxicity symptoms need be expected from the ingestion of naturally occurring fluorine of fish, as evidenced from these tests.

## RESEARCH ASSOCIATES AND STUDENT ASSISTANTS

Because of the relatively small size of the Bureau's technological staff, and the rather broad field of research it must cover, it is only possible, as indicated previously, to undertake those problems which are of a fundamental nature, those which have promise of the greatest value to the largest number of persons whose livelihood depends in whole or in part on the fisheries, and those which are possible with the funds and personnel available. For this reason the Division cannot, with present facilities, attack problems of special or restricted interest affecting certain products, process, methods, or industries. However, the Bureau has available, under an arrangement similar to that of other scientific Government bureaus, facilities for research associates and student assistants in its laboratories. The salaries and expenses of these employees are paid by the firms or groups who are interested in the problems on which they are working, and the investigations are carried out under the supervision of the Bureau's technologists in its laboratories and under its control. Thus the Bureau provides these industries and groups with laboratory, consulting, and library facilities, which, in most instances, cannot be obtained elsewhere.

Within the limits of its facilities, the Bureau also has opened its technological laboratories to research students who are pursuing courses in universities, and who are selecting investigational problems in the fisheries as their major study. This may prove of special benefit to the industry as it brings its problems to the attention of a large group of research workers who in turn may spread interest to applied fishery research.

In the preceding sections of this report we have given the names of organizations which are conducting cooperative projects under the supervision of our technological staff, and which have employed research associates for this purpose. In the preceding section on laboratories we have given the individual names of these research associates and student assistants. The plan of utilizing graduate student assistants for part-time work on research projects has been so successful that the University of Maryland employed from its own funds additional graduate students, by establishing two research fellowships for work on fishery technological research. Some of the new research problems assigned to these research fellows are: (1) Studies on the enzymes in fresh and frozen fish; and (2) chemical and pharmacological studies on the oxidized oils in fish meals. These projects are selected by the student in accordance with his qualifications, approved by both the Bureau and the University, and the results are prepared in a thesis submitted for a master's or a doctor's degree at the end of 3 years of part-time work. The results of such studies are of direct value to the industry. This plan also serves to educate and train scientific fishery investigators for employment by industry and government.

### COOPERATION WITH GOVERNMENTS OF DENMARK AND ICELAND

Early in the spring of 1940, at the request of the Danish Government, the facilities of the College Park Laboratory were opened to Ingi Bjarnason, of Iceland, as a Research Fellow. Mr. Bjarnason was in the United States on a scholarship given to him by the Icelandic Government for the purpose of studying the fisheries of this country. While at the laboratory in College Park he conducted research dealing with the development of leather bates from pyloric caeca of cod and haddock. Mr. Bjarnason completed this study early in June and is now summarizing the results of the study for publication.

## EDUCATIONAL AND CONSULTING SERVICE

In addition to the research activities described in this report, our economic and technological staffs conduct, along with their regular duties, an educational and consulting service for those interested in the fisheries. During recent years the demand for this type of service has increased. Many requests have been received from groups and individuals to demonstrate improved methods developed in our laboratories for the handling and processing of fishery products, for instruction in fish cookery, and for aid in improving various marketing practices. Insofar as our facilities have permitted, we have complied with these requests, endeavoring to offer assistance especially where the request has come from a large group or industry. However, we have not been able to satisfy all of the requests received because of insufficient personnel and because of inadequate funds to provide for travel expenses of the demonstrators.

Some of the educational services rendered are discussed or referred to in previous paragraphs of this report. In brief, this work has covered the fields of commercial preserving of fishery products, fish cookery in the home, and the marketing of aquatic products.

Another phase of this service has consisted of answering thousands of letters directed to the Bureau on fishery subjects and of supplying information to persons who have called at the Bureau personally. Many of the latter came from foreign lands to seek fishery information which might be useful in the conduct of the fishing industry in their native country.

## PUBLICATIONS OF THE DIVISION

During the calendar year 1939, the following publications were prepared and addresses delivered by members of the Division's staff. These do not include the monthly statistical bulletins of the landings of fishery products at Boston and Gloucester, Mass.; Portland, Maine; and Seattle, Wash.; the monthly reports on the cold-storage holdings of fish and quantities of fish frozen; or the daily reports and monthly summaries of the Fishery Market News Service. The administrative reports, investigational reports, and fishery circulars may be purchased, at the prices shown, from the Superintendent of Documents, Government Printing Office, Washington, D. C. The statistical bulletins and special or S-memoranda are distributed free upon request to the Bureau. The special articles may be obtained from the sources of publication.

Those wishing to receive copies of this report, statistical bulletins as issued, or the periodic Fishery Market News reports issued from the Washington office, should request that their names be placed on the Bureau's mailing lists as follows: No. 128 for this report, 128a for general statistical bulletins, 128b for monthly cold-storage reports, and 128d for the periodic Fishery Market News reports. Those desiring daily reports or monthly summaries of fishery market news, issued from the Division's Fishery Market News offices, should apply direct to the Fishery Market News Service at the nearest of the following six addresses: 33A Fulton Street, New York, N. Y.; 253½ Northern Avenue, Boston, Mass.; 200 North Jefferson Street, Chicago, Ill.; 309 Duval Building, Jacksonville, Fla.; 417 Bell Street Terminal Seattle, Wash.; or 1100 Decatur Street, New Orleans, La. For historical statistical data on the domestic fisheries for the period 1880 to 1929, consult the report entitled "Fishery Industries of the United States, 1930," by R. H. Fiedler, appendix II to the report of the United States Commissioner of Fisheries for the fiscal year 1931. Statistical information for the years 1930 to 1937, inclusive, may be obtained from the annual reports of the Division for the years 1931 to 1938, inclusive.

## DOCUMENTS, REPORTS, AND CIRCULARS

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Fishery industries of the United States, 1938. 8°, 380 pp. Administrative Report No. 37. Appendix III to Report of Commissioner of Fisheries, 1939. 25 cents.

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Pacific salmon oils. 8°, 21 pp., 4 figs. Investigational Report No. 40. 5 cents.

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PUNCOCHAR, JOSEPH F., WILLIAM B. LANHAM, JR., and HUGO W. NILSON.

Some effects of ultraviolet irradiation of haddock fillets. 8°, 8 pp., 5 figs. Investigational Report No. 43. 5 cents.

## SPECIAL ARTICLES AND ADDRESSES

ANDERSON, ANDREW W.

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JARVIS, NORMAN D.

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Spiced or pickled herring. Bureau of Fisheries' Memorandum S–348, Washington, D. C.

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Manning, J. R. (deceased).

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## STATISTICAL BULLETINS

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Fisheries of the Chesapeake Bay States, 1937. Statistical Bulletin No. 1315.
Fisheries of the South Atlantic and Gulf States, 1937. Statistical Bulletin No. 1311.
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# Part 2. FISHERY STATISTICS, 1938

## GENERAL REVIEW

Data on the 1938 catch of fishery products were collected in all sections of the United States and Alaska except the Mississippi River area. The combined catch in the areas surveyed shows a decline of 2 percent in volume and 7 percent in value as compared with the catch in the same sections during the preceding year. Decreased catches were made in each of the geographical sections except the Chesapeake Bay and South Atlantic and Gulf States. Marked declines in the value of the catch occurred in the New England, South Atlantic and Gulf, and Pacific Coast States, and in Alaska. The value of the pack of canned fishery products in all sections declined 21 percent as compared with 1937; byproducts decreased 17 percent; cured fish about 5 percent; and packaged fish, 2 percent.

The total catch of fishery products in the United States and Alaska, as based on the most recent surveys, amounted to 4,253,445,000 pounds, valued at $93,547,000. Slightly over 130,000 fishermen were employed in making this catch.

The production of canned fishery products in the United States and Alaska during 1938 amounted to 667,527,840 pounds, valued at $83,445,889; the output of byproducts was valued at $30,576,367; the production of frozen fishery products, excluding packaged products amounted to 117,125,519 pounds, estimated to be valued at $7,800,000; and fresh and frozen packaged fish and shellfish, 216,661,255 pounds, valued at $27,243,645. Based on surveys for 1938 in all sections except the Mississippi River area, and for 1931 in that area, the production of cured fishery products amounted to 102,617,256 pounds, valued at $14,865,530. It is estimated that about 680,000,000 pounds of fresh fishery products (excluding packaged fish and shellfish) valued at about $50,000,000 were marketed during 1938. The total marketed value to domestic primary handlers of all fishery products in 1938 is estimated at $214,000,000.

*New England States.*—In 1938 the commercial catch of fishery products in these States showed an appreciable decrease in both the quantity and value as compared with 1937. Smaller catches of cod, hake, haddock, and sea herring chiefly contributed to the decrease, while catches of mackerel approximately doubled as compared with 1937.

A comparison of the combined vessel landings at Boston and Gloucester, Mass., and Portland, Maine, which are available for 1937 and 1938, shows that although the 1938 landings increased 3 percent in quantity, they declined 9 percent in value as compared with the preceding year.

*Middle Atlantic States.*—Although the yield of the commercial fisheries in the Middle Atlantic States during 1938 was less than in 1937, the value of the products landed showed an increase. Fewer fishermen and fishing vessels operated in 1938 than in 1937, and the value of the manufactured fishery products showed a marked decline as compared with 1937. The catch of shad in the Hudson River likewise decreased.

*Chesapeake Bay States.*—In 1938 the catch of fishery products in these States increased both in volume and value. Catches of alewives, croaker, and spot increased, as did the catch of all species of shellfish taken in this section. The value of menhaden products produced in Virginia, and of fresh-shucked oysters in both States, decreased as compared with 1937, while the total value of salted alewives and fresh-cooked crab meat increased.

*South Atlantic and Gulf States.*—As compared with 1937, the 1938 catch of fishery products in the South Atlantic and Gulf States sharply increased in poundage; however, the value of the catch declined. The catch of menhaden, a low-priced fish, materially increased, while the catch of oysters and shrimp decreased. Likewise, the value of manufactured fishery products declined owing mainly to a decrease in the pack of canned oysters and shrimp, and in the production of fresh-cooked crab meat.

*Pacific Coast States.*—The commercial catch of fishery products in the three Pacific Coast States in 1938 declined both in volume and value as compared with the previous year. The 1938 production of canned sardines, tuna, and salmon was less than in 1937; however, the pack of canned mackerel and oysters increased. Although the production of pilchard meal and oil was greater than in the previous year, the combined value of these products was less.

*Lake States.*—In 1938 the yield of the commercial fisheries of the Lake States decreased in volume, but increased in value. The value of manufactured products, which consist largely of smoked, and fresh and frozen packaged fish, increased as compared with 1937.

*Mississippi River and tributaries.*—The most recent complete statistics of the catch of the Mississippi River and tributaries are those collected for 1931. As compared with 1922, when the most recent preceding survey was made, there was a decrease in the catch. The decrease was caused principally by a smaller catch of fresh-water mussels. A survey made for Lakes Pepin and Keokuk, and the Mississippi River between these lakes, for 1938, revealed an increase in the catch of fishery products in Lake Pepin and the Mississippi River between these lakes, but a decrease in the catch in Lake Keokuk as compared with the previous year. The production of fresh-water mussel-shell buttons declined in 1938 as compared with 1937.

*Alaska.*—The catch of fishery products in Alaska in 1938 decreased both in poundage and in value as compared with 1937. A slight decline occurred in the yield of the salmon and herring fisheries as well as in the production of shellfish. The value of cured and frozen fishery products increased while fresh and canned products and byproducts decreased in value as compared with the previous year.

## *Fisheries of the United States and Alaska, 1938* [1]

### SUMMARY OF CATCH: BY SECTIONS

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Product | New England, area XXII | | Middle Atlantic, area XXIII | | Chesapeake, area XXIII | | South Atlantic and Gulf, areas XXIV and XXV | | Pacific | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Fish | 581,198 | 12,014 | 181,814 | 3,827 | 202,823 | 2,590 | 433,896 | 5,822 | 1,496,320 | 23,987 |
| Shellfish, etc | 50,322 | 6,261 | 35,044 | 4,422 | 91,771 | 4,073 | 187,962 | 7,252 | 29,565 | 2,099 |
| Total | 631,520 | 18,275 | 216,858 | 8,249 | 294,594 | 6,663 | 621,858 | 13,074 | 1,525,885 | 26,086 |

| Product | Lakes | | Mississippi River and tributaries | | Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Fish | 81,219 | 6,076 | 44,062 | 2,257 | 791,423 | 11,881 | 3,812,755 | 68,454 |
| Shellfish, etc | 305 | 7 | 38,321 | 640 | 2,526 | 159 | 435,816 | 24,913 |
| Whale products | | | | | 4,874 | 180 | 4,874 | 180 |
| Total | 81,524 | 6,083 | 82,383 | 2,897 | 798,823 | 12,220 | 4,253,445 | 93,547 |

NOTE.—The roman numerals appearing under the names of the sections are the numbers given these areas by the North American Council on Fishery Investigations. It should be explained that there are included under these areas craft whose principal fishing ports are in the respective areas but at times they may fish elsewhere.

### OPERATING UNITS: BY SECTIONS

| Item | New England | Middle Atlantic | Chesapeake | South Atlantic and Gulf | Pacific |
|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 5,123 | 2,357 | 2,537 | 4,565 | 9,235 |
| On boats and shore | 15,125 | 5,192 | 12,760 | 25,023 | 14,400 |
| Total | 20,248 | 7,549 | 15,297 | 29,588 | 23,635 |
| Vessels: | | | | | |
| Steam | 20 | 7 | 25 | | 1 |
| Net tonnage | 3,215 | 884 | 2,880 | | 32 |
| Motor | 645 | 398 | 179 | 1,042 | 1,341 |
| Net tonnage | 19,313 | 6,951 | 2,805 | 12,656 | 39,125 |
| Sail | | 4 | 137 | 73 | 3 |
| Net tonnage | | 36 | 1,703 | 691 | 1,421 |
| Total vessels | 665 | 409 | 341 | 1,115 | 1,345 |
| Total net tonnage | 22,528 | 7,871 | 7,388 | 13,347 | 40,578 |
| Boats: | | | | | |
| Motor | 4,510 | 1,631 | 5,993 | 7,132 | 5,583 |
| Other | 4,490 | 2,442 | 5,285 | 9,083 | 989 |
| Accessory boats | 661 | 111 | 99 | 229 | 924 |
| Apparatus: | | | | | |
| Haul seines | 84 | 211 | 326 | 902 | 226 |
| Purse seines | 99 | 32 | 33 | 56 | 613 |
| Lampara nets | | | | | 233 |
| Otter trawls | 509 | 215 | 28 | 3,463 | 74 |
| Beam trawls | | | | | 21 |
| Paranzella nets | | | | | 12 |
| Gill nets | 6,856 | 3,594 | 8,991 | 10,292 | 3,980 |
| Trammel and bar nets | | | | 985 | 34 |
| Pound nets, trap nets, and weirs | 524 | 412 | 2,419 | 2,762 | 38 |
| Stop nets | 53 | 68 | | | |
| Fyke nets | 140 | 1,416 | 2,900 | 665 | 1,660 |
| Bag nets | 138 | | | | 9 |
| Other nets [3] | 498 | 285 | 1,624 | 7,697 | 628 |
| Hooks, baits, or snoods | 2,687,707 | 493,669 | 2,145,820 | 1,127,219 | 1,439,654 |
| Fish wheels | | | | 6 | |
| Eel pots and traps | 3,945 | 3,529 | 14,970 | 1,750 | |
| Brush traps | | | | 29,600 | |
| Lobster pots and traps | 302,510 | 16,323 | | | |
| Crab, crawfish, and turtle pots and traps | 5,834 | 10 | 830 | 10,494 | 38,520 |

[1] All figures are for 1938, except those for the Mississippi River and tributaries, which are for 1931.

[3] Includes dip, push, reef, crab, drag, cast, and drop nets.

## *Fisheries of the United States and Alaska, 1938*—Continued

### OPERATING UNITS: BY SECTIONS—Continued

| Item | New England | Middle Atlantic | Chesapeake | South Atlantic and Gulf | Pacific |
|---|---|---|---|---|---|
| Apparatus—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* |
| Clam dredges | 102 | 105 | | 1 | |
| Crab dredges | | 74 | 296 | | |
| Mussel dredges | 4 | 8 | | | |
| Oyster dredges | 150 | 285 | 447 | 864 | 2 |
| Scallop dredges | 3,270 | 56 | | 54 | |
| Crab scrapes | | | 784 | | |
| Tongs, rakes, shovels, hoes, forks, picks, and grabs | 6,757 | 3,878 | 6,967 | 3,440 | 5,846 |
| Diving outfits | | | | 72 | 18 |
| Other apparatus [5] | 1,453 | 10,817 | 450 | 6,816 | 436 |

| Item | Lakes | Mississippi River and tributaries | Alaska | Total |
|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* |
| On vessels | 1,616 | | [2] 11,007 | 36,440 |
| On boats and shore | 5,360 | 15,884 | | 93,744 |
| Total | 6,976 | 15,884 | 11,007 | 130,184 |
| Vessels: | | | | |
| Steam | 44 | | 5 | 102 |
| Net tonnage | 1,019 | | 417 | 8,447 |
| Motor | 425 | | 830 | 4,860 |
| Net tonnage | 5,003 | | 11,364 | 97,217 |
| Sail | | | | 217 |
| Net tonnage | | | | 3,851 |
| Total vessels | 469 | | 835 | 5,179 |
| Total net tonnage | 6,022 | | 11,781 | 109,515 |
| Boats: | | | | |
| Motor | 1,662 | 4,426 | 1,682 | 32,619 |
| Other | 1,659 | 10,120 | 3,403 | 37,471 |
| Accessory boats | | | | 2,024 |
| Apparatus: | | | | |
| Haul seines | 325 | 1,013 | 155 | 3,242 |
| Purse seines | | | 722 | 1,555 |
| Lampara nets | | | | 233 |
| Otter trawls | | | 1 | 4,290 |
| Beam trawls | | | 7 | 28 |
| Paranzella nets | | | | 12 |
| Gill nets | 177,167 | 101 | 4,719 | 215,700 |
| Trammel and bar nets | 116 | 518 | | 1,653 |
| Pound nets, trap nets, and weirs | 11,199 | 374 | 465 | 18,193 |
| Stop nets | | | | 121 |
| Fyke nets | 2,905 | 32,541 | | 42,227 |
| Bag nets | | | | 147 |
| Other nets [3] | | 191 | 100 | 11,023 |
| Hooks, baits, or snoods | 3,685,250 | 2,459,179 | (4) | 14,038,498 |
| Fish wheels | | | 241 | 247 |
| Eel pots and traps | | | | 24,194 |
| Brush traps | | | | 29,600 |
| Lobster pots and traps | | | | 318,833 |
| Crab, crawfish, and turtle pots and traps | 740 | 456 | 2,193 | 59,077 |
| Clam dredges | | | | 208 |
| Crab dredges | | | | 370 |
| Mussel dredges | | 440 | | 452 |
| Oyster dredges | | | | 1,748 |
| Scallop dredges | | | | 3,380 |
| Crab scrapes | | | | 784 |
| Tongs, rakes, shovels, hoes, forks, picks, and grabs | 19 | 3,994 | | 30,901 |
| Diving outfits | | | | 90 |
| Crowfoot bars | 62 | 4,480 | | 4,542 |
| Other apparatus [5] | | 3,781 | | 23.753 |

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[2] Includes persons in boats and shore fisheries.
[3] Includes dip, push, reef, crab, drag, cast, and drop nets.
[4] Number not determined.
[5] Includes periwinkle, cockle, and fish pots; harpoons, spears, hooks, coquina scoops, octopus and slat traps, and wire baskets.

NOTE.—The South Atlantic and Gulf section includes the fisheries of Lake Okeechobee, Fla.

*Fisheries of the United States and Alaska, 1938*—Continued

CATCH: BY SECTIONS

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Species | New England | | Middle Atlantic | | Chesapeake | | South Atlantic and Gulf | | Pacific | |
|---|---|---|---|---|---|---|---|---|---|---|
| FISH | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Alewives | 4,307 | 20 | 122 | 2 | 23,087 | 215 | 11,611 | 114 | | |
| Amberjack | | | 1 | (6) | | | 24 | 1 | | |
| Anchovies | 61 | 1 | 10 | (6) | | | | | 735 | 9 |
| Angelfish | | | | | | | 1 | (6) | | |
| Barracuda | | | | | | | (6) | (6) | 2,530 | 159 |
| Black bass | | | | | 93 | 10 | | | | |
| Bluefish | 121 | 11 | 1,291 | 111 | 354 | 22 | 6,393 | 306 | | |
| Blue runner or hard-tail | | | | | | | 749 | 9 | | |
| Bonito | 28 | 3 | 805 | 31 | 42 | 1 | 11 | (6) | | |
| Bowfin | | | | | | | 5 | (6) | | |
| Buffalofish | | | | | | | 60 | 2 | | |
| Butterfish | 1,880 | 69 | 8,599 | 306 | 3,205 | 45 | 15 | (6) | | |
| Cabio or crab eater | | | | | 23 | 1 | 8 | (6) | | |
| Cabrilla | | | | | | | | | 145 | 7 |
| Carp | 35 | 2 | 628 | 43 | 824 | 50 | 225 | 3 | 130 | 4 |
| Catfish and bullheads | | | 182 | 12 | 1,181 | 44 | 4,961 | 178 | 312 | 41 |
| Cigarfish | | | | | | | 9 | (6) | | |
| Cod | 118,385 | 2,211 | 10,848 | 469 | (6) | (6) | | | 10,352 | 142 |
| Crappie | | | | | 3 | (6) | 561 | 19 | | |
| Crevalle | 1 | (6) | | | | | 190 | 4 | | |
| Croaker | 1,729 | 32 | 5,987 | 72 | 46,310 | 599 | 6,692 | 98 | | |
| Cunner | 90 | 1 | 2 | (6) | | | | | | |
| Cusk | 7,545 | 130 | (6) | (6) | | | | | | |
| Dolphin | | | | | | | 3 | (6) | | |
| Drum: | | | | | | | | | | |
| Black | | | 1 | (6) | 126 | 1 | 1,859 | 56 | | |
| Red or redfish | 2 | (6) | 5 | (6) | 136 | 2 | 3,303 | 173 | | |
| Eels: | | | | | | | | | | |
| Common | 514 | 28 | 376 | 31 | 295 | 27 | 123 | 4 | | |
| Conger | 126 | 3 | 38 | 1 | 4 | (6) | | | | |
| Flounders | 46,836 | 1,571 | 14,908 | 804 | 838 | 46 | 1,035 | 64 | 15,401 | 739 |
| Flying fish | | | | | | | | | 63 | 2 |
| Frigate mackerel | 2 | (6) | 72 | 1 | | | | | | |
| Gizzard shad | | | (6) | (6) | 562 | 7 | 63 | 1 | | |
| Goosefish | (6) | (6) | 3 | (6) | | | | | | |
| Groupers | | | 17 | 1 | | | 4,814 | 151 | 68 | 3 |
| Grunts | | | | | | | 54 | 1 | | |
| Haddock | 157,935 | 3,453 | 11,109 | 414 | | | | | | |
| Hake | 23.827 | 321 | 365 | 9 | 12 | (6) | | | 36 | (6) |
| Halibut | 1,972 | 206 | 48 | 6 | | | | | 23,900 | 1,931 |
| Hardheads | | | | | | | | | 13 | 1 |
| Harvestfish or "star-fish" | | | | | 490 | 8 | 429 | 13 | | |
| Herring, sea | 21,047 | 191 | 1,175 | 7 | | | | | 872 | 7 |
| Herring smelt | (6) | (6) | | | | | | | | |
| Hickory shad | 7 | (6) | 29 | (6) | 167 | 3 | 156 | 4 | | |
| Hogchoker | | | | | 2 | (6) | | | | |
| Hogfish | | | | | (6) | (6) | 45 | 1 | | |
| Horse mackerel | | | | | | | | | 4,134 | 46 |
| Jewfish | | | | | | | 136 | 5 | | |
| Kingfish (California) | | | | | | | | | 493 | 13 |
| Kingfish or "king mackerel" | | | 140 | 5 | | | 3,667 | 137 | | |
| King whiting or "king-fish" | 7 | (6) | 105 | 4 | 265 | 11 | 2,084 | 58 | | |
| Lamprey | 2 | (6) | | | | | | | | |
| Launce | | | (6) | (6) | | | | | | |
| "Lingcod" | | | | | | | | | 3,810 | 105 |
| Mackerel | 39,346 | 1,165 | 3,923 | 148 | 20 | 1 | | | 79,848 | 859 |
| Menhaden | 328 | 2 | 86,941 | 340 | 95,083 | 361 | 303,122 | 825 | | |
| Minnows | (6) | (6) | | | | | | | | |
| Mojarra | | | | | | | 333 | 8 | | |
| Moonfish | | | | | | | (6) | (6) | | |
| Mullet | | | 85 | 3 | 27 | 1 | 36,139 | 1,193 | 4 | (6) |
| Muttonfish | | | | | | | 283 | 18 | | |
| Paddlefish or spoonbill cat | | | | | | | 40 | 4 | | |
| Permit | | | | | | | 16 | (6) | | |
| Pigfish | | | | | | | 71 | 1 | | |
| Pike or pickerel | | | | | 46 | 7 | 1 | (6) | | |
| Pilchard or sardine | | | | | | | | | 1,110,401 | 6,312 |
| Pinfish | | | | | | | 24 | (6) | | |

[6] Less than 500 pounds or dollars.

*Fisheries of the United States and Alaska, 1938*—Continued

CATCH: BY SECTIONS—Continued

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Species | New England | | Middle Atlantic | | Chesapeake | | South Atlantic and Gulf | | Pacific | |
|---|---|---|---|---|---|---|---|---|---|---|
| FISH—continued | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Pollock | 40, 287 | 449 | 407 | 8 | (6) | (6) | | | | |
| Pompano | | | | | | | 807 | 165 | 1 | (6) |
| Rock bass | | | | | | | | | 286 | 16 |
| Rockfishes | | | | | | | | | 4, 506 | 191 |
| Rosefish | 65, 005 | 803 | | | | | | | | |
| Rudderfish | | | | | | | | | 28 | 1 |
| Sablefish | | | | | | | | | 3, 309 | 137 |
| Salmon: | | | | | | | | | | |
| Atlantic | 16 | 5 | | | | | | | | |
| Blueback, red, or sockeye | | | | | | | | | 10, 891 | 845 |
| Chinook or king | | | | | | | | | 24, 359 | 2, 884 |
| Chum or keta | | | | | | | | | 12, 331 | 266 |
| Humpback or pink | | | | | | | | | 39 | 1 |
| Silver or coho | | | | | | | | | 16, 615 | 930 |
| Sand perch | | | 1 | (6) | 7 | (6) | | | | |
| Sculpin | | | | | | | | | 155 | 9 |
| Scup or porgy | 11, 804 | 275 | 7, 442 | 123 | 2, 366 | 38 | 59 | 2 | | |
| Sea bass | 3, 727 | 155 | 2, 249 | 126 | 344 | 15 | 203 | 11 | | |
| Sea bass, black (California) | | | | | | | | | 408 | 24 |
| Sea bass, white (California) | | | | | | | | | 629 | 54 |
| Sea catfish | | | | | | | 221 | 6 | | |
| Sea robin | 373 | 4 | 85 | 1 | 3 | (6) | | | | |
| Shad | 503 | 30 | 3, 591 | 286 | 4, 207 | 394 | 1, 418 | 217 | 1, 798 | 68 |
| Sharks, including grayfish | 198 | 5 | 243 | 3 | 237 | 3 | 3, 682 | 24 | 8, 092 | 141 |
| Sheepshead: | | | | | | | | | | |
| Fresh-water | | | | | | | 5 | (6) | | |
| Salt-water | | | | | | | 976 | 31 | 72 | 3 |
| Silversides | | | 2 | (6) | | | | | | |
| Skates | 354 | 4 | 139 | 1 | 9 | (6) | | | 528 | 5 |
| Skipper or "billfish" | 1 | (6) | | | | | | | | |
| Smelt | 767 | 68 | (6) | (6) | | | | | 4, 092 | 150 |
| Snapper: | | | | | | | | | | |
| Lane | | | | | | | 2 | (6) | | |
| Mangrove | | | | | | | 296 | 10 | | |
| Red | | | 32 | 2 | | | 8, 110 | 586 | | |
| Snook or sergeantfish | | | | | | | 617 | 21 | | |
| Spadefish | | | | | | | 11 | (6) | | |
| Spanish mackerel | | | 10 | 1 | 457 | 31 | 7, 225 | 337 | 13 | 1 |
| Splittail | | | | | | | | | 11 | (6) |
| Spot | 8 | (6) | 186 | 3 | 3, 926 | 74 | 6, 180 | 100 | | |
| Squawfish | | | | | | | | | 1 | (6) |
| Squeteagues or "sea trout": | | | | | | | | | | |
| Gray | 339 | 10 | 7, 543 | 240 | 13, 617 | 261 | 5, 100 | 196 | | |
| Spotted | | | | | 402 | 33 | 7, 239 | 541 | | |
| White | | | | | | | 249 | 9 | | |
| Squirrel hake | | | 162 | 2 | | | | | | |
| Steelhead trout | | | | | | | | | 2, 264 | 140 |
| Striped bass | 301 | 29 | 311 | 37 | 2, 869 | 232 | 523 | 49 | 44 | 2 |
| Sturgeon | 11 | 1 | 10 | 2 | 16 | 2 | 72 | 8 | 112 | 13 |
| Suckers | 124 | 3 | 91 | 4 | 4 | (6) | 2 | (6) | (6) | (6) |
| Sunfish | | | 1 | (6) | 9 | (6) | 868 | 31 | | |
| Surffishes (perch) | | | | | | | | | 313 | 12 |
| Swellfish | | | 58 | 2 | 34 | 1 | 1 | (6) | | |
| Swordfish | 2, 088 | 350 | 51 | 10 | | | | | 722 | 81 |
| Tautog | 198 | 7 | 44 | 1 | 2 | (6) | 1 | (6) | | |
| Tenpounder | | | | | | | 370 | 7 | | |
| Tilefish | 367 | 14 | 808 | 25 | | | | | | |
| Tomcod | 19 | 1 | 5 | (6) | 7 | (6) | | | 3 | (6) |
| Tripletail | | | | | | | 18 | (6) | | |
| Tuna and tunalike fishes: | | | | | | | | | | |
| Albacore | | | | | | | | | 17, 726 | 966 |
| Bluefin | 1, 567 | 58 | 256 | 10 | | | 1 | (6) | 17, 728 | 983 |
| Bonito | | | | | | | | | 7, 753 | 286 |
| Skipjack | | | | | | | | | 22, 654 | 1, 133 |
| Yellowfin | | | | | | | | | 78, 318 | 4, 705 |
| Turbot | | | | | | | 2 | (6) | | |
| Whitebait | | | | | | | | | 107 | 7 |
| Whitefish, common | | | | | | | | | 68 | 4 |

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[6] Less than 500 pounds or dollars.

## *Fisheries of the United States and Alaska, 1938*—Continued

### CATCH: BY SECTIONS—Continued

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Species | New England | | Middle Atlantic | | Chesapeake | | South Atlantic and Gulf | | Pacific | |
|---|---|---|---|---|---|---|---|---|---|---|
| FISH—continued | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| White perch | 2 | (6) | 71 | 5 | 727 | 26 | 145 | 6 | ------ | ------ |
| Whiting | 25,095 | 274 | 10,184 | 114 | 140 | 3 | ------ | ------ | ------ | ------ |
| Wolffish | 2,612 | 49 | 6 | (6) | ------ | ------ | ------ | ------ | ------ | ------ |
| Yellow perch | 19 | (6) | 11 | 1 | 245 | 15 | 9 | (6) | ------ | ------ |
| Yellowtail: | | | | | | | | | | |
| Atlantic | ------ | ------ | ------ | ------ | ------ | ------ | 169 | 14 | ------ | ------ |
| Pacific | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 6,812 | 253 |
| Miscellaneous | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 285 | 6 |
| Total | 581,198 | 12,014 | 181,814 | 3,827 | 202,823 | 2,590 | 433,896 | 5,822 | 1,496,320 | 23,987 |
| SHELLFISH, ETC. | | | | | | | | | | |
| Crabs: | | | | | | | | | | |
| Hard | 2,048 | 52 | 1,684 | 61 | 49,390 | 871 | 25,154 | 347 | 12,899 | 658 |
| King or "horseshoe" | ------ | ------ | 2,541 | 6 | ------ | ------ | ------ | ------ | ------ | ------ |
| Soft and peelers | (6) | (6) | 439 | 135 | 5,681 | 436 | 377 | 56 | ------ | ------ |
| Stone | ------ | ------ | ------ | ------ | ------ | ------ | 54 | 12 | ------ | ------ |
| Crawfish | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 94 | 8 |
| Lobsters: | | | | | | | | | | |
| Common | 11,408 | 2,143 | 574 | 102 | 2 | (6) | ------ | ------ | ------ | ------ |
| Spiny | ------ | ------ | ------ | ------ | ------ | ------ | 328 | 23 | 1,198 | 179 |
| Shrimp | 105 | 8 | 125 | 21 | 8 | 1 | 140,150 | 4,545 | 1,872 | 40 |
| Abalone | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 421 | 92 |
| Clams: | | | | | | | | | | |
| Coquina | ------ | ------ | ------ | ------ | ------ | ------ | 16 | (6) | ------ | ------ |
| Hard | 4,729 | 493 | 5,193 | 773 | 2,863 | 385 | 1,105 | 100 | 875 | 69 |
| Pismo | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 54 | 11 |
| Razor | 513 | 14 | ------ | ------ | ------ | ------ | ------ | ------ | 1,228 | 212 |
| Soft | 12,735 | 844 | 1,246 | 88 | 2 | 1 | ------ | ------ | 28 | 6 |
| Surf | 1 | (6) | 1,614 | 72 | ------ | ------ | ------ | ------ | ------ | ------ |
| Mixed | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 93 | 8 |
| Limpets | 1 | (5) | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Conchs | ------ | ------ | 7 | 1 | ------ | ------ | 8 | (6) | ------ | ------ |
| Mussels, sea | 24 | 1 | 243 | 18 | 30 | 1 | ------ | ------ | ------ | ------ |
| Octopus | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 97 | 5 |
| Oysters, market: | | | | | | | | | | |
| Eastern, public | 135 | 24 | 545 | 111 | 22,428 | 1,442 | 13,078 | 681 | ------ | ------ |
| Eastern, private | 8,503 | 1,530 | 15,599 | 2,585 | 10,984 | 928 | 6,603 | 389 | 48 | 18 |
| Pacific | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 8,734 | 562 |
| Western | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 275 | 188 |
| Periwinkles and "cockles" | 94 | 5 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Scallops: | | | | | | | | | | |
| Bay | 1,227 | 385 | 21 | 6 | ------ | ------ | 167 | 19 | 20 | 5 |
| Sea | 5,850 | 622 | 3,059 | 359 | ------ | ------ | ------ | ------ | ------ | ------ |
| Squid | 2,153 | 29 | 2,047 | 34 | 363 | 4 | ------ | ------ | 1,615 | 37 |
| Sea urchins | 97 | (6) | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Terrapin | ------ | ------ | ------ | ------ | 9 | 3 | 18 | 3 | ------ | ------ |
| Turtles | 3 | (6) | 58 | 4 | 11 | 1 | 298 | 6 | ------ | ------ |
| Irish moss | 177 | 16 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Kelp | 120 | 1 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Sponges | ------ | ------ | ------ | ------ | ------ | ------ | 606 | 1,071 | ------ | ------ |
| Bloodworms | 143 | 41 | 22 | 21 | ------ | ------ | ------ | ------ | ------ | ------ |
| Sandworms | 256 | 53 | 27 | 25 | ------ | ------ | ------ | ------ | ------ | ------ |
| Trepang | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 11 | 1 |
| Total | 50,322 | 6,261 | 35,044 | 4,422 | 91,771 | 4,073 | 187,962 | 7,252 | 29,565 | 2,099 |
| Grand total | 631,520 | 18,275 | 216,858 | 8,249 | 294,594 | 6,663 | 621,858 | 13,074 | 1,525,885 | 26,086 |

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[6] Less than 500 pounds or dollars.

## *Fisheries of the United States and Alaska, 1938*—Continued

### CATCH: BY SECTIONS—Continued

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Species | Lakes | | Mississippi River and tributaries | | Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| FISH | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Alewives | | | | | | | 39, 127 | 351 |
| Amberjack | | | | | | | 25 | 1 |
| Anchovies | | | | | | | 806 | 10 |
| Angelfish | | | | | | | 1 | (6) |
| Barracuda | | | | | | | 2, 530 | 159 |
| Black bass | | | 14 | 2 | | | 107 | 12 |
| Bluefish | | | | | | | 8, 159 | 450 |
| Blue pike | 8, 718 | 594 | | | | | 8, 718 | 594 |
| Blue runner or hardtail | | | | | | | 749 | 9 |
| Bonito | | | | | | | 886 | 35 |
| Bowfin | 6 | (6) | 428 | 9 | | | 439 | 9 |
| Buffalofish | | | 15, 772 | 688 | | | 15, 832 | 690 |
| Burbot | 358 | 6 | | | | | 358 | 6 |
| Butterfish | | | | | | | 13, 699 | 420 |
| Cabio or crab eater | | | | | | | 31 | 1 |
| Cabrilla | | | | | | | 145 | 7 |
| Carp | 4, 859 | 170 | 11, 892 | 455 | | | 18, 593 | 727 |
| Catfish and bullheads | 791 | 58 | 10, 267 | 878 | | | 17, 694 | 1, 211 |
| Chubs | 5, 852 | 703 | | | | | 5, 852 | 703 |
| Cigarfish | | | | | | | 9 | (6) |
| Cisco | 846 | 103 | | | | | 846 | 103 |
| Cod | | | | | 960 | 5 | 140, 545 | 2, 827 |
| Crappie | (6) | (6) | 41 | 3 | | | 605 | 22 |
| Crevalle | | | | | | | 191 | 4 |
| Croaker | | | | | | | 60, 718 | 801 |
| Cunner | | | | | | | 92 | 1 |
| Cusk | | | | | | | 7, 545 | 130 |
| Dolly Varden trout | | | | | 91 | 7 | 91 | 7 |
| Dolphin | | | | | | | 3 | (6) |
| Drum: | | | | | | | | |
| Black | | | | | | | 1, 986 | 57 |
| Red or redfish | | | | | | | 3, 446 | 175 |
| Eels: | | | | | | | | |
| Common | 44 | 3 | 7 | 1 | | | 1, 359 | 94 |
| Conger | | | | | | | 168 | 4 |
| Flounders | | | | | 258 | 7 | 79, 276 | 3, 231 |
| Flying fish | | | | | | | 63 | 2 |
| Frigate mackerel | | | | | | | 74 | 1 |
| Garfish | 6 | (6) | 73 | 1 | | | 79 | 1 |
| Gizzard shad | | | | | | | 625 | 8 |
| Goldfish | 215 | 9 | | | | | 215 | 9 |
| Goosefish | | | | | | | 3 | (6) |
| Groupers | | | | | | | 4, 899 | 155 |
| Grunts | | | | | | | 54 | 1 |
| Haddock | | | | | | | 169, 044 | 3, 867 |
| Hake | | | | | | | 24, 240 | 330 |
| Halibut | | | | | 19, 366 | 981 | 45, 286 | 3, 124 |
| Hardheads | | | | | | | 13 | 1 |
| Harvestfish or "starfish" | | | | | | | 919 | 21 |
| Herring: | | | | | | | | |
| Lake | 20, 523 | 635 | | | | | 20, 523 | 635 |
| Sea | | | | | 179, 735 | 899 | 202, 829 | 1, 104 |
| Herring smelt | | | | | | | (6) | (6) |
| Hickory shad | | | | | | | 359 | 7 |
| Hogchoker | | | | | | | 2 | (6) |
| Hogfish | | | | | | | 45 | 1 |
| Horse mackerel | | | | | | | 4, 134 | 46 |
| Jewfish | | | | | | | 136 | 5 |
| Kingfish (California) | | | | | | | 493 | 13 |
| Kingfish or "king mackerel" | | | | | | | 3, 807 | 142 |
| King whiting or "kingfish" | | | | | | | 2, 461 | 73 |
| Lake trout | 9, 360 | 1, 497 | | | | | 9, 360 | 1, 497 |
| Lamprey | | | | | | | 2 | (6) |
| Launce | | | | | | | (6) | (6) |
| "Lingcod" | | | | | 2 | 1 | 3, 812 | 106 |
| Mackerel | | | | | | | 123, 137 | 2, 173 |
| Menhaden | | | | | | | 485, 474 | 1, 528 |
| Minnows | | | 1 | (6) | | | 1 | (6) |
| Mojarra | | | | | | | 333 | 8 |
| Mooneye | 11 | 1 | 3 | (6) | | | 14 | 1 |
| Moonfish | | | | | | | (6) | (6) |
| Mullet | | | | | | | 36, 255 | 1, 197 |

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[6] Less than 500 pounds or dollars.

## *Fisheries of the United States and Alaska, 1938*—Continued

### CATCH: BY SECTIONS—Continued

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Species | Lakes | | Mississippi River and tributaries | | Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| FISH—continued | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Muttonfish | | | | | | | 283 | 18 |
| Paddlefish or spoonbill cat | | | 951 | 43 | | | 991 | 47 |
| Permit | | | | | | | 16 | (6) |
| Pigfish | | | | | | | 71 | 1 |
| Pike or pickerel | 231 | 19 | 5 | (6) | | | 283 | 26 |
| Pilchard or sardine | | | | | | | 1, 110, 401 | 6, 312 |
| Pinfish | | | | | | | 24 | (6) |
| Pollock | | | | | | | 40, 694 | 457 |
| Pompano | | | | | | | 808 | 165 |
| Quillback | | | 268 | 11 | | | 268 | 11 |
| Rock bass | 38 | 2 | | | | | 324 | 18 |
| Rockfishes | | | | | 7 | (6) | 4, 513 | 191 |
| Rosefish | | | | | | | 65, 005 | 803 |
| Rudderfish | | | | | | | 28 | 1 |
| Sablefish | | | | | 1, 290 | 39 | 4, 599 | 176 |
| Salmon: | | | | | | | | |
| Atlantic | | | | | | | 16 | 5 |
| Blueback, red, or sockeye | | | | | 234, 203 | 5, 027 | 245, 094 | 5, 872 |
| Chinook or king | | | | | 18, 554 | 466 | 42, 913 | 2, 650 |
| Chum or keta | | | | | 76, 770 | 754 | 89, 101 | 1, 020 |
| Humpback or pink | | | | | 235, 937 | 3, 193 | 235, 976 | 3, 194 |
| Silver or coho | | | | | 24, 242 | 502 | 40, 857 | 1, 432 |
| Sand perch | | | | | | | 8 | (6) |
| Sauger | 935 | 91 | 2 | (6) | | | 937 | 91 |
| Sculpin | | | | | | | 155 | 9 |
| Scup or porgy | | | | | | | 20, 951 | 438 |
| Sea bass | | | | | | | 6, 523 | 307 |
| Sea bass, black (California) | | | | | | | 408 | 24 |
| Sea bass, white (California) | | | | | | | 629 | 54 |
| Sea catfish | | | | | | | 221 | 6 |
| Sea robin | | | | | | | 461 | 5 |
| Shad | | | | | | | 11, 517 | 995 |
| Sharks, including grayfish | | | | | | | 12, 452 | 176 |
| Sheepshead: | | | | | | | | |
| Fresh-water | 3, 417 | 101 | 3, 905 | 143 | | | 7, 327 | 244 |
| Salt-water | | | | | | | 1, 048 | 34 |
| Silversides | | | | | | | 2 | (6) |
| Skates | | | | | | | 1, 030 | 10 |
| Skipper or "billfish" | | | | | | | 1 | (6) |
| Smelt | 1, 846 | 55 | | | | | 6, 705 | 273 |
| Snapper: | | | | | | | | |
| Lane | | | | | | | 2 | (6) |
| Mangrove | | | | | | | 296 | 10 |
| Red | | | | | | | 8, 142 | 588 |
| Snook or sergeantfish | | | | | | | 617 | 21 |
| Spadefish | | | | | | | 11 | (6) |
| Spanish mackerel | | | | | | | 7, 705 | 370 |
| Splittail | | | | | | | 11 | (6) |
| Spot | | | | | | | 10, 300 | 177 |
| Squawfish | | | | | | | 1 | (6) |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | | | | | 26, 599 | 707 |
| Spotted | | | | | | | 7, 641 | 574 |
| White | | | | | | | 249 | 9 |
| Squirrel hake | | | | | | | 162 | 2 |
| Steelhead trout | 1 | (6) | | | 8 | (6) | 2, 273 | 140 |
| Striped bass | | | | | | | 4, 048 | 349 |
| Sturgeon | 31 | 10 | | | | | 252 | 26 |
| Sturgeon, shovelnose | | | 88 | 8 | | | 88 | 8 |
| Suckers | 5, 002 | 154 | 315 | 13 | | | 5, 538 | 174 |
| Sunfish | 44 | 3 | 22 | 1 | | | 944 | 35 |
| Surffishes (perch) | | | | | | | 313 | 12 |
| Swellfish | | | | | | | 93 | 3 |
| Swordfish | | | | | | | 2, 861 | 441 |
| Tautog | | | | | | | 245 | 8 |
| Tenpounder | | | | | | | 370 | 7 |
| Tilefish | | | | | | | 1, 175 | 39 |
| Tomcod | | | | | | | 34 | 1 |
| Tripletail | | | | | | | 18 | (6) |
| Tullibees | 878 | 44 | | | | | 878 | 44 |

[6] Less than 500 pounds or dollars.

## *Fisheries of the United States and Alaska, 1938*—Continued

### CATCH: BY SECTIONS—Continued

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Species | Lakes | | Mississippi River and tributaries | | Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| FISH—continued | | | | | | | | |
| Tuna and tunalike fishes: | | | | | | | | |
| Albacore | | | | | | | 17, 726 | 966 |
| Bluefin | | | | | | | 19, 552 | 1, 051 |
| Bonito | | | | | | | 7, 753 | 286 |
| Skipjack | | | | | | | 22, 654 | 1, 133 |
| Yellowfin | | | | | | | 78, 318 | 4, 705 |
| Turbot | | | | | | | 2 | (6) |
| Whitebass | 736 | 43 | 3 | (6) | | | 739 | 43 |
| Whitebait | | | | | | | 107 | 7 |
| Whitefish: | | | | | | | | |
| Common | 3, 302 | 659 | | | | | 3, 370 | 663 |
| Menominee | 153 | 15 | | | | | 153 | 15 |
| White perch | | | | | | | 945 | 37 |
| Whiting | | | | | | | 35, 419 | 391 |
| Wolffish | | | | | | | 2, 618 | 49 |
| Yellow perch | 8, 017 | 602 | | | | | 8, 301 | 618 |
| Yellow pike | 4, 999 | 499 | 5 | 1 | | | 5, 004 | 500 |
| Yellowtail: | | | | | | | | |
| Atlantic | | | | | | | 169 | 14 |
| Pacific | | | | | | | 6, 812 | 253 |
| Miscellaneous | | | | | | | 285 | 6 |
| Total | 81, 219 | 6, 076 | 44, 062 | 2, 257 | 791, 423 | 11, 881 | 3, 812, 755 | 68, 454 |
| SHELLFISH, ETC. | | | | | | | | |
| Crabs: | | | | | | | | |
| Hard | | | | | 886 | 81 | 92, 061 | 2, 070 |
| King (Pacific coast) | | | | | 49 | 5 | 49 | 5 |
| King or "horseshoe" | | | | | | | 2, 541 | 6 |
| Soft and peelers | | | | | | | 6, 497 | 627 |
| Stone | | | | | | | 54 | 12 |
| Crawfish | 6 | 1 | 29 | (6) | | | 129 | 9 |
| Lobsters: | | | | | | | | |
| Common | | | | | | | 11, 984 | 2, 245 |
| Spiny | | | | | | | 1, 526 | 202 |
| Shrimp | | | 49 | 4 | 792 | 34 | 143, 101 | 4, 653 |
| Abalone | | | | | | | 424 | 92 |
| Clams: | | | | | | | | |
| Coquina | | | | | | | 16 | (6) |
| Hard | | | | | 14 | (6) | 14, 779 | 1, 820 |
| Pismo | | | | | | | 54 | 11 |
| Razor | | | | | 785 | 39 | 2, 526 | 265 |
| Soft | | | | | | | 14, 011 | 939 |
| Surf | | | | | | | 1, 615 | 72 |
| Mixed | | | | | | | 93 | 8 |
| Limpets | | | | | | | 1 | (6) |
| Conchs | | | | | | | 15 | 1 |
| Mussels, sea | | | | | | | 297 | 20 |
| Mussel shells | 299 | 6 | 37, 255 | 422 | | | 37, 554 | 428 |
| Octopus | | | | | | | 97 | 5 |
| Oysters, market: | | | | | | | | |
| Eastern, public | | | | | | | 36, 186 | 2, 258 |
| Eastern, private | | | | | | | 41, 737 | 5, 450 |
| Pacific | | | | | | | 8, 734 | 562 |
| Western | | | | | | | 275 | 188 |
| Periwinkles and "cockles" | | | | | | | 94 | 5 |
| Scallops: | | | | | | | | |
| Bay | | | | | | | 1, 435 | 415 |
| Sea | | | | | | | 8, 909 | 981 |
| Squid | | | | | | | 6, 178 | 104 |
| Sea urchins | | | | | | | 97 | (6) |
| Terrapin | | | 19 | (6) | | | 46 | 6 |
| Turtles | | | 94 | 3 | | | 464 | 14 |
| Frogs | | | 875 | 131 | | | 875 | 131 |
| Irish moss | | | | | | | 177 | 16 |
| Kelp | | | | | | | 120 | 1 |
| Sponges | | | | | | | 606 | 1, 071 |
| Pearls and slugs | | (6) | | 80 | | | | 80 |
| Bloodworms | | | | | | | 165 | 62 |
| Sandworms | | | | | | | 283 | 78 |
| Trepang | | | | | | | 11 | 1 |
| Total | 305 | 7 | 38, 321 | 640 | 2, 526 | 159 | 435, 816 | 24, 913 |

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(6) Less than 500 pounds or dollars.

## *Fisheries of the United States and Alaska, 1938*—Continued

### CATCH: By sections—Continued

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Species | Lakes | | Mississippi River and tributaries | | Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| WHALE PRODUCTS [7] | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Meal | | | | | 1,224 | 21 | 1,224 | 21 |
| Oil, sperm | | | | | 1,364 | 55 | 1,364 | 55 |
| Oil, whale | | | | | 2,286 | 104 | 2,286 | 104 |
| Total | | | | | 4,874 | 180 | 4,874 | 180 |
| Grand total | 81,524 | 6,083 | 82,383 | 2,897 | 798,823 | 12,220 | 4,253,445 | 93,547 |

### CATCH: By States

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| States | Marine and coastal rivers | | Mississippi River and tributaries | | Lakes [8] | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Alabama | 10,917 | 449 | 1,822 | 33 | | | 12,739 | 482 |
| Arkansas | | | 15,733 | 411 | | | 15,733 | 411 |
| California | 1,294,526 | 17,055 | | | | | 1,294,526 | 17,055 |
| Connecticut | 11,838 | 1,420 | | | | | 11,838 | 1,420 |
| Delaware | 17,507 | 144 | | | | | 17,507 | 144 |
| Florida | 239,108 | 4,908 | | | 2,335 | 80 | 241,443 | 4,988 |
| Georgia | 19,835 | 381 | | | | | 19,835 | 381 |
| Illinois | | | 14,263 | 367 | 1,155 | 157 | 15,418 | 524 |
| Indiana | | | 7,718 | 157 | 763 | 66 | 8,481 | 223 |
| Iowa | | | 7,778 | 302 | | | 7,778 | 302 |
| Kansas | | | 455 | 17 | | | 455 | 17 |
| Kentucky | | | 1,622 | 61 | | | 1,622 | 61 |
| Louisiana | 103,883 | 3,391 | 19,213 | 995 | | | 123,096 | 4,386 |
| Maine | 67,207 | 2,521 | | | | | 67,207 | 2,521 |
| Maryland | 57,263 | 2,260 | | | | | 57,263 | 2,260 |
| Massachusetts | 537,850 | 13,169 | | | | | 537,850 | 13,169 |
| Michigan | | | | | 28,838 | 2,265 | 28,838 | 2,265 |
| Minnesota | | | 3,498 | 138 | 8,203 | 291 | 11,701 | 429 |
| Mississippi | 14,260 | 603 | 2,650 | 123 | | | 16,910 | 726 |
| Missouri | | | 928 | 77 | | | 928 | 77 |
| Nebraska | | | 145 | 16 | | | 145 | 16 |
| New Hampshire | 796 | 109 | | | | | 796 | 109 |
| New Jersey | 108,095 | 2,908 | | | | | 108,095 | 2,908 |
| New York | 91,217 | 5,193 | | | 2,376 | 209 | 93,593 | 5,402 |
| North Carolina | 198,765 | 1,950 | | | | | 198,765 | 1,950 |
| Ohio | | | 185 | 7 | 22,040 | 1,503 | 22,225 | 1,510 |
| Oklahoma | | | 40 | 4 | | | 40 | 4 |
| Oregon | 71,728 | 2,400 | | | | | 71,728 | 2,400 |
| Pennsylvania | 39 | 4 | | | 2,674 | 268 | 2,713 | 272 |
| Rhode Island | 13,829 | 1,056 | | | | | 13,829 | 1,056 |
| South Carolina | 7,911 | 274 | | | | | 7,911 | 274 |
| South Dakota | | | 114 | 11 | | | 114 | 11 |
| Tennessee | | | 3.435 | 104 | | | 3,435 | 104 |
| Texas | 24,844 | 1,036 | 139 | 6 | | | 24,983 | 1,042 |
| Virginia | 237,331 | 4,403 | | | | | 237,331 | 4,403 |
| Washington | 159,631 | 6,632 | | | | | 159,631 | 6,632 |
| Wisconsin | | | 2,645 | 68 | 15,475 | 1,325 | 18,120 | 1,393 |
| Alaska | 798,823 | 12,220 | | | | | 798,823 | 12,220 |
| Total | 4,087,203 | 84,486 | 82,383 | 2,897 | 83,859 | 6,164 | 4,253,445 | 93,547 |

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[7] The weight of whales caught was not determined; therefore, the weight of manufactured products is shown.

[8] Includes Lake Ontario, Lake Erie, Lake Huron, Lake Michigan, Lake Superior, Rainy Lake, Namakan Lake, Lake of the Woods, Lake Okeechobee, and several mussel-bearing streams tributary to Lakes Huron, Erie, and Michigan.

NOTE.—This table does not include data on the whale fishery conducted by United States enterprise in the Southern Hemisphere. There were 7,254,300 gallons of whale oil, valued at $3,025,831, produced in this fishery during 1938.

*Fisheries of the United States and Alaska, 1938*—Continued

### SEED OYSTER FISHERY

| Item | New England | | Middle Atlantic | | Chesapeake | | Total | |
|---|---|---|---|---|---|---|---|---|
| OPERATING UNITS | | | | | | | | |
| Fishermen: | *Number* | | *Number* | | *Number* | | *Number* | |
| On vessels | 185 | | 1,440 | | 42 | | 1,667 | |
| On boats and shore: | | | | | | | | |
| Regular | 81 | | 126 | | 1,260 | | 1,467 | |
| Casual | 93 | | 31 | | 138 | | 262 | |
| Total | 359 | | 1,597 | | 1,440 | | 3,396 | |
| Vessels: | | | | | | | | |
| Steam | 3 | | | | | | 3 | |
| Net tonnage | 279 | | | | | | 279 | |
| Motor | 17 | | 13 | | 14 | | 44 | |
| Net tonnage | 415 | | 267 | | 74 | | 756 | |
| Sail | 21 | | 118 | | | | 139 | |
| Net tonnage | 155 | | 2,713 | | | | 2,868 | |
| Total vessels | 41 | | 131 | | 14 | | 186 | |
| Total net tonnage | 849 | | 2,980 | | 74 | | 3,903 | |
| Boats: | | | | | | | | |
| Motor | 23 | | 102 | | 542 | | 667 | |
| Other | 104 | | 32 | | 162 | | 298 | |
| Apparatus: | | | | | | | | |
| Dredges | 182 | | 255 | | | | 437 | |
| Yards at mouth | 161 | | 333 | | | | 494 | |
| Tongs | 96 | | 157 | | | | 253 | |
| Rakes | 27 | | | | | | 27 | |
| CATCH | | | | | | | | |
| Oysters, seed: | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* | *Bushels* | *Value* |
| Public, spring | 90,812 | $60,913 | 1,616,678 | $496,882 | 613,800 | $122,890 | 2,321,290 | $680,685 |
| Public, fall | 28,822 | 23,396 | 7,108 | 5,983 | 620,340 | 109,068 | 656,270 | 138,447 |
| Private, spring | 328,061 | 335,063 | 29,800 | 32,553 | | | 357,861 | 367,596 |
| Private, fall | 25,379 | 24,161 | 20,533 | 23,113 | | | 45,912 | 47,274 |
| Total | 473,074 | 443,533 | 1,674,119 | 558,511 | 1,234,140 | 231,958 | 3,381,333 | 1,234,002 |

NOTE.—Of the total number of persons fishing for seed oysters, 2,367 are duplicated among those fishing for market oysters or other species. Similarly the following craft and gear are duplicated: 11 motor vessels, 72 sailing vessels, 343 motorboats, 277 other boats, 162 dredges, 556 tongs, and 135 rakes.

*Yield of the fisheries of the United States, 1938:*[1] *By gear*

| Gear | New England | | Middle Atlantic | | Chesapeake | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Purse seines | 33,813,700 | $933,356 | 84,558,600 | $390,972 | 93,612,000 | $358,798 |
| Haul seines | 1,376,100 | 37,973 | 1,642,100 | 107,725 | 10,842,500 | 293,560 |
| Stop seines | 10,183,600 | 109,686 | ---------- | ---------- | ---------- | ---------- |
| Gill nets | 22,415,700 | 370,709 | 4,697,500 | 307,426 | 1,525,700 | 118,849 |
| Lines | 60,082,900 | 1,449,623 | 6,993,800 | 308,798 | 44,010,700 | 782,232 |
| Pound nets | 22,370,400 | 344,183 | 40,723,300 | 858,082 | 84,735,700 | 1,508,106 |
| Floating traps | 8,271,300 | 169,103 | ---------- | ---------- | ---------- | ---------- |
| Other traps | 71,700 | 5,449 | ---------- | ---------- | 16,200 | 389 |
| Weirs | 5,770,000 | 48,308 | 1,176,000 | 2,806 | ---------- | ---------- |
| Stop nets | ---------- | ---------- | 271,000 | 20,703 | ---------- | ---------- |
| Fyke nets | 174,800 | 7,153 | 439,200 | 26,909 | 1,566,200 | 87,137 |
| Dip nets | 4,303,100 | 62,601 | [2] 694,400 | [2] 147,104 | 1,617,800 | 129,976 |
| Cast nets | ---------- | ---------- | 4,700 | 422 | ---------- | ---------- |
| Bag nets | 147,900 | 12,250 | 100,000 | 17,000 | ---------- | ---------- |
| Push nets | 49,100 | 14,624 | ---------- | ---------- | ---------- | ---------- |
| Otter trawls | 412,235,400 | 8,164,343 | 45,085,900 | 1,795,099 | 10,726,000 | 228,750 |
| Pots | 13,708,100 | 2,211,140 | 2,050,900 | 184,624 | 640,600 | 28,552 |
| Harpoons | 2,290,700 | 355,474 | 51,300 | 9,572 | ---------- | ---------- |
| Spears | 20,300 | 1,950 | 25,000 | 1,674 | ---------- | ---------- |
| Scrapes, crab | ---------- | ---------- | ---------- | ---------- | 2,842,500 | 178,370 |
| Dredges | 15,786,500 | 2,458,921 | 21,033,500 | 3,022,101 | 13,679,700 | 735,322 |
| Tongs | 1,972,000 | 228,203 | 3,793,500 | 641,109 | 23,757,300 | 1,705,496 |
| Rakes | 2,252,600 | 292,357 | 2,072,100 | 249,792 | 2,063,600 | 170,920 |
| Forks | 8,027,300 | 450,631 | 53,700 | 46,840 | ---------- | ---------- |
| Hoes | 5,857,200 | 525,683 | 870,700 | 54,223 | ---------- | ---------- |
| Picks | ---------- | ---------- | ---------- | ---------- | 420,000 | 78,750 |
| By hand | 339,900 | 21,462 | 521,300 | 56,263 | 2,537,400 | 257,744 |
| Total | 631,520,300 | 18,275,182 | 216,858,500 | 8,249,244 | 294,593,900 | 6,662,951 |

| Gear | South Atlantic and Gulf | | Pacific | | Lakes | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Purse seines | 300,697,000 | $814,673 | 1,026,100,500 | $7,713,344 | ---------- | ---------- |
| Haul seines | 35,933,800 | 1,053,896 | 3,687,700 | 231,733 | 5,484,800 | $220,567 |
| Gill nets | 46,494,100 | 1,906,983 | 34,520,700 | 1,914,688 | 38,273,700 | 3,176,278 |
| Trammel nets | 8,373,800 | 442,090 | 925,100 | 75,930 | 167,100 | 5,080 |
| Lines | 47,772,900 | 1,508,585 | 208,663,200 | 10,972,186 | 2,332,200 | 364,813 |
| Pound nets | 14,830,400 | 325,027 | 1,095,400 | 68,383 | 9,016,500 | 555,726 |
| Other traps | 81,000 | 12,000 | 14,019,700 | 834,949 | 23,018,200 | 1,596,293 |
| Weirs | ---------- | ---------- | 245,100 | 2,745 | ---------- | ---------- |
| Wheels | 11,200 | 148 | ---------- | ---------- | ---------- | ---------- |
| Fyke nets | 431,500 | 12,284 | 339,600 | 40,448 | 2,927,000 | 157,923 |
| Dip nets | 1,127,900 | 46,155 | 4,398,000 | 208,853 | ---------- | ---------- |
| Cast nets | 358,400 | 14,807 | ---------- | ---------- | ---------- | ---------- |
| Bag nets | ---------- | ---------- | 1,451,600 | 28,320 | ---------- | ---------- |
| Push nets | [3] 16,000 | [3] 300 | ---------- | ---------- | ---------- | ---------- |
| Reef nets | ---------- | ---------- | 476,800 | 27,092 | ---------- | ---------- |
| Lampara and ring nets | ---------- | ---------- | 198,367,500 | 1,902,276 | ---------- | ---------- |
| Paranzella nets | ---------- | ---------- | [4] 12,525,200 | [4] 595,635 | ---------- | ---------- |
| Otter trawls | 139,751,100 | 4,526,134 | 6,147,100 | 175,787 | ---------- | ---------- |
| Beam trawls | ---------- | ---------- | 440,300 | 16,693 | ---------- | ---------- |
| Pots | 3,693,500 | 108,055 | ---------- | ---------- | 6,000 | 450 |
| Harpoons | ---------- | ---------- | 721,800 | 80,708 | ---------- | ---------- |
| Spears | 517,600 | 33,054 | ---------- | ---------- | ---------- | ---------- |
| Dredges | 11,471,900 | 607,059 | (5) | (5) | ---------- | ---------- |
| Tongs | 6,896,300 | 452,149 | [5] 11,335,000 | [5] 1,074,552 | ---------- | ---------- |
| Crowfoot bars | ---------- | ---------- | ---------- | ---------- | 225,400 | 4,600 |
| Rakes | 387,400 | 35,727 | (5) | (5) | ---------- | ---------- |
| Forks | 2,900 | 322 | ---------- | ---------- | ---------- | ---------- |
| Grabs | 1,022,900 | 42,423 | ---------- | ---------- | ---------- | ---------- |
| Picks | ---------- | ---------- | ---------- | ---------- | 30,000 | 770 |
| Hooks | 160,600 | 216,062 | ---------- | ---------- | ---------- | ---------- |
| Diving apparatus, abalone and sponge | 482,000 | 857,930 | 424,300 | 91,979 | ---------- | ---------- |
| By hand | 1,343,900 | 57,540 | ---------- | ---------- | 43,600 | 712 |
| Total | 621,858,100 | 13,073,403 | 1,525,884,600 | 26,086,301 | 81,524,500 | 6,083,212 |

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[1] Data are for 1938 except those for Mississippi River and tributaries which are for 1931.
[2] Includes the catch by drop nets and wire baskets.
[3] This catch was made by scoop nets.
[4] Includes a small catch by otter trawls.
[5] The catch by shovels, rakes, and dredges is included with tongs.

*Yield of the fisheries of the United States, 1938: By gear*—Continued

| Gear | Mississippi River and tributaries | | Total | |
|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* |
| Purse seines | ---------- | ---------- | 1, 538, 781, 800 | $10, 211, 143 |
| Haul seines | 13, 739, 657 | $574, 541 | 72, 706, 657 | 2, 519, 995 |
| Stop seines | ---------- | ---------- | 10, 183, 600 | 109, 686 |
| Gill nets | 166, 598 | 6, 547 | 148, 093, 998 | 7, 831, 480 |
| Trammel nets | 1, 134, 206 | 75, 615 | 10, 600, 206 | 598, 715 |
| Lines | 10, 140, 037 | 772, 245 | 379, 995, 737 | 16, 158, 482 |
| Pound nets | 224, 275 | 9, 541 | 172, 995, 975 | 3, 669, 048 |
| Floating traps | ---------- | ---------- | 8, 271, 300 | 169, 103 |
| Other traps | ---------- | ---------- | 37, 206, 800 | 2, 449, 080 |
| Weirs | ---------- | ---------- | 7, 191, 100 | 53, 859 |
| Wheels | ---------- | ---------- | 11, 200 | 148 |
| Stop nets | ---------- | ---------- | 271, 000 | 20, 703 |
| Fyke nets | 18, 507, 204 | 797, 130 | 24, 385, 504 | 1, 128, 984 |
| Dip nets | 30, 045 | 3, 307 | 12, 171, 245 | 597, 996 |
| Cast nets | ---------- | ---------- | 363, 100 | 15, 229 |
| Bag nets | ---------- | ---------- | 1, 699, 500 | 57, 570 |
| Push nets | ---------- | ---------- | 65, 100 | 14, 924 |
| Reef nets | ---------- | ---------- | 476, 800 | 27, 092 |
| Lampara and ring nets | ---------- | ---------- | 198, 367, 500 | 1, 902, 276 |
| Paranzella nets | ---------- | ---------- | 12, 525, 200 | 595, 635 |
| Otter trawls | ---------- | ---------- | 613, 945, 500 | 14, 890, 113 |
| Beam trawls | ---------- | ---------- | 440, 300 | 16, 693 |
| Pots | [6] 310, 455 | [6] 26, 277 | 20, 409, 555 | 2, 559, 098 |
| Harpoons | ---------- | ---------- | 3, 063, 800 | 445, 754 |
| Spears | 2, 250 | 270 | 565, 150 | 36, 948 |
| Scrapes, crab | ---------- | ---------- | 2, 842, 500 | 178, 370 |
| Dredges | 3, 699, 100 | 40, 958 | 65, 670, 700 | 6, 864, 361 |
| Tongs | 1, 601, 876 | 21, 091 | 49, 355, 976 | 4, 122, 600 |
| Crowfoot bars | 20, 893, 550 | 265, 443 | 21, 118, 950 | 270, 043 |
| Rakes | 370, 130 | 4, 029 | 7, 145, 830 | 752, 825 |
| Forks | 4, 812, 737 | 76, 214 | 12, 896, 637 | 574, 007 |
| Hoes | ---------- | ---------- | 6, 727, 900 | 579, 906 |
| Grabs | 873, 099 | 130, 621 | 1, 895, 999 | 173, 044 |
| Picks | ---------- | ---------- | 450, 000 | 79, 520 |
| Hooks | ---------- | ---------- | 160, 600 | 216, 062 |
| Diving apparatus, abalone and sponge | ---------- | ---------- | 906, 300 | 949, 909 |
| By hand | 5, 877, 304 | 93, 528 | 10, 663, 404 | 487, 249 |
| Total | 82, 382, 523 | 2, 897, 357 | 3, 454, 622, 423 | 81, 327, 650 |

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[6] Includes the catch by baskets.

*Industries related to the fisheries of the United States and Alaska, 1938* [1]

| Item | New England | Middle Atlantic | Chesapeake | South Atlantic and Gulf |
|---|---|---|---|---|
| Transporting: | | | | |
| Persons engaged: | *Number* | *Number* | *Number* | *Number* |
| On vessels | 241 | 134 | 1,187 | 325 |
| On boats | 65 | 104 | ---------- | 188 |
| Total | 306 | 238 | 1,187 | 513 |
| Vessels: | | | | |
| Motor | 91 | 34 | 593 | 121 |
| Net tonnage | 1,485 | 568 | 6,545 | 1,127 |
| Sail | ---------- | ---------- | ---------- | 36 |
| Net tonnage | ---------- | ---------- | ---------- | 359 |
| Total vessels | 91 | 34 | 593 | 157 |
| Total net tonnage | 1,485 | 568 | 6,545 | 1,486 |
| Boats | 35 | 82 | ---------- | 138 |
| Wholesale and manufacturing: | | | | |
| Establishments | 421 | 383 | 582 | 742 |
| Persons engaged: | | | | |
| Proprietors | 440 | 179 | 737 | 770 |
| Salaried employees | 754 | 952 | 379 | 575 |
| Wage earners: | | | | |
| Average for season | 10,968 | 5,065 | 11,728 | 16,822 |
| Average for year | 6,038 | 3,598 | 5,070 | 5,470 |
| Salaries and wages paid | $6,969,883 | $7,413,363 | $3,135,628 | $3,452,182 |
| Manufactured products | $19,967,143 | $15,435,934 | $9,224,417 | $11,762,783 |
| Fishermen's manufactured products: | | | | |
| Persons engaged | 3,396 | 287 | 128 | 1,323 |
| Products | $1,216,024 | $347,970 | $17,009 | $264,271 |

| Item | Pacific | Lakes | Mississippi River and tributaries | Alaska | Total |
|---|---|---|---|---|---|
| Transporting: | | | | | |
| Persons engaged: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 190 | 30 | 29 | 1,923 | 4,059 |
| On boats | 1 | ---------- | ---------- | (2) | 358 |
| Total | 191 | 30 | 29 | 1,923 | 4,417 |
| Vessels: | | | | | |
| Steam | ---------- | 2 | ---------- | 5 | 7 |
| Net tonnage | ---------- | 63 | ---------- | 18,608 | 18,671 |
| Motor | 74 | 15 | 8 | 396 | 1,332 |
| Net tonnage | 1,539 | 175 | 104 | 13,989 | 25,532 |
| Sail | ---------- | ---------- | ---------- | ---------- | 36 |
| Net tonnage | ---------- | ---------- | ---------- | ---------- | 359 |
| Total vessels | 74 | 17 | 8 | 401 | 1,375 |
| Total net tonnage | 1,539 | 238 | 104 | 32,597 | 44,562 |
| Boats | 1 | ---------- | ---------- | [3] 718 | 974 |
| Wholesale and manufacturing: | | | | | |
| Establishments | 341 | 214 | 217 | 230 | 3,130 |
| Persons engaged: | | | | | |
| Proprietors | 315 | 146 | 204 | 15,154 | 90,244 |
| Salaried employees | 1,155 | 486 | 355 | | |
| Wage earners: | | | | | |
| Average for season | 16,645 | 2,140 | 4,275 | | |
| Average for year | 6,065 | 1,268 | 3,483 | (4) | (4) |
| Salaries and wages paid | $10,282,514 | $2,830,878 | $3,080,430 | (4) | (4) |
| Manufactured products | $48,621,239 | $3,560,743 | $2,482,729 | $40,946,478 | $152,001,466 |
| Fishermen's manufactured products: | | | | | |
| Persons engaged | 133 | 206 | 216 | (4) | (4) |
| Products | $150,872 | $104,470 | $8,751 | (4) | (4) |

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[1] Data for Mississippi River and tributaries are for 1931 except that the value shown for manufactured products includes that of mussell-shell products for 1938.

[2] Included on vessels.

[3] Includes scows, houseboats, pile drivers, etc.

[4] Statistics not available.

NOTE.—Of the total number of persons engaged in the preparation of fishermen's manufactured products 5,327 have also been included as fishermen, and 1,866 of the persons shown on transporting craft have also been included as fishermen.

## MANUFACTURED FISHERY PRODUCTS

The output of manufactured fishery products (canned, cured, packaged, and byproducts), in the United States and Alaska during the most recent years for which data are available was valued at $156,131,431. Of this amount, canned products accounted for 53 percent, byproducts 20 percent, fresh and frozen packaged products 17 percent, and cured products 10 percent.

Since complete general statistical surveys were conducted for 1938 in each of the geographical sections of the United States and Alaska, except the Mississippi River area, the following compilation of manufactured fishery products consists of data for 1938 with the exception of a small quantity of salted and smoked fish produced in the Mississippi River section.

*Manufactured fishery products of the United States and Alaska, 1938* [1]

| Item | Quantity | Value |
|---|---|---|
| Alewives: | | |
| Salted: | | |
| Round ... pounds | 1, 114, 600 | $36, 292 |
| Corned ... do | 5, 739, 155 | 120, 255 |
| Pickled [2] ... do | 5, 188, 900 | 134, 037 |
| Spiced ... do | 2, 511, 300 | 400, 800 |
| Tight-pack cut ... do | 1, 166, 350 | 38, 164 |
| Tight-pack roe ... do | 58, 620 | 2, 369 |
| Smoked ... do | 221, 250 | 10, 712 |
| Canned ... standard cases | 52, 826 | 143, 558 |
| Roe, canned ... do | 37, 641 | 165, 711 |
| Oil ... gallons | 18, 681 | 3, 277 |
| Amberjack, smoked ... pounds | 2, 180 | 545 |
| Barracuda, fresh fillets ... do | 300, 000 | 44, 575 |
| Bluefish, smoked ... do | 1, 200 | 216 |
| Blue pike: | | |
| Fresh fillets ... do | 2, 241, 695 | 477, 679 |
| Frozen fillets ... do | 317, 250 | 65, 013 |
| Blue runner, salted ... do | 325, 800 | 12, 962 |
| Buffalofish, smoked [3] ... do | 477, 000 | 113, 226 |
| Butterfish, smoked [3] ... do | 625, 325 | 159, 223 |
| Cabrilla, fresh fillets ... do | 85, 000 | 16, 300 |
| Carp, smoked [3] ... do | 308, 017 | 89, 184 |
| Catfish and bullheads, smoked ... do | 10, 400 | 2, 080 |
| Chub, cisco, and tullibee, smoked [3] ... do | 7, 130, 861 | 2, 030, 968 |
| Cod: | | |
| Fresh fillets ... do | 12, 270, 194 | 1, 236, 041 |
| Frozen fillets ... do | 8, 607, 443 | 753, 713 |
| Fresh sticks ... do | 310, 900 | 34, 865 |
| Smoked fillets ... do | 622, 334 | 69, 170 |
| Salted: | | |
| Green [2] ... do | 3, 888, 231 | 164, 004 |
| Dry ... do | 4, 253, 922 | 298, 411 |
| Boneless and absolutely boneless ... do | 9, 492, 797 | 1, 479, 789 |
| Tongues ... do | 25, 220 | 2, 442 |
| Roe ... do | 94 | 19 |
| Stockfish ... do | 6, 678 | 878 |
| Oil: | | |
| Cod ... gallons | 4, 604 | 1, 308 |
| Cod-liver ... do | 261, 556 | 164, 986 |
| Croaker: | | |
| Fresh fillets ... pounds | 142, 000 | 14, 230 |
| Fresh pan-dressed ... do | 280, 000 | 21, 000 |
| Cusk: | | |
| Fresh fillets ... do | 1, 091, 785 | 105, 532 |
| Frozen fillets ... do | 184, 915 | 14, 813 |
| Fresh sticks ... do | 636, 300 | 65, 788 |
| Salted: | | |
| Green [2] ... do | 1, 600 | 40 |
| Boneless ... do | 121, 958 | 9, 145 |
| Smoked fillets ... do | 753, 223 | 74, 780 |
| Eels: | | |
| Salted ... do | 132, 854 | 12, 179 |
| Smoked [3] ... do | 122, 938 | 32, 286 |
| Flounders: | | |
| Fresh fillets ... do | 5, 818, 521 | 901, 264 |
| Frozen fillets ... do | 1, 876, 905 | 265, 262 |
| Fresh steaks ... do | 120, 000 | 86, 500 |

See footnotes at end of table.

*Manufactured fishery products of the United States and Alaska, 1938*—Continued

| Item | Quantity | Value |
|---|---|---|
| Grouper: | | |
| Fresh fillets...pounds | 52,000 | $8,350 |
| Fresh steaks...do | 421,630 | 69,471 |
| Fillets, salted...do | 9,000 | 900 |
| Smoked...do | 1,100 | 215 |
| Haddock: | | |
| Fresh fillets...do | 20,176,963 | 2,034,755 |
| Frozen fillets...do | 21,203,405 | 1,382,355 |
| Fresh sticks...do | 73,000 | 11,300 |
| Smoked fillets...do | 45,300 | 8,450 |
| Finnan haddie...do | 733,509 | 65,574 |
| Finnan haddie, canned...standard cases | 488 | 7,518 |
| Hake: | | |
| Fresh fillets...pounds | 2,523,591 | 207,690 |
| Frozen fillets...do | 351,948 | 20,385 |
| Fresh sticks...do | 674,800 | 65,432 |
| Salted: | | |
| Green [2]...do | 1,873,142 | 59,547 |
| Dry...do | 1,020,059 | 57,908 |
| Boneless and absolutely boneless...do | 207,538 | 15,695 |
| Halibut: | | |
| Fresh fillets...do | 34,500 | 10,150 |
| Frozen steaks...do | 82,089 | 13,052 |
| Salted, green...do | 4,900 | 398 |
| Herring, lake: | | |
| Fresh fillets...do | 33,965 | 3,579 |
| Salted...do | 3,561,960 | 132,960 |
| Smoked...do | 698,944 | 71,659 |
| Herring, sea: | | |
| Salted: | | |
| Pickled, Scotch cure...do | 2,186,150 | 130,424 |
| Brine salted...do | 382,000 | 11,870 |
| Pickled in vinegar...do | 835,900 | 35,522 |
| Norwegian cure...do | 192,800 | 5,784 |
| Roe...do | 2,100 | 357 |
| Roused...do | 416,900 | 12,755 |
| Spiced...do | 549,438 | 49,828 |
| Split...do | 289,500 | 11,177 |
| Smoked: | | |
| Hard bloaters...do | 170,050 | 9,749 |
| Soft bloaters...do | 491,140 | 28,028 |
| Unclassified bloaters...do | 481,530 | 53,940 |
| Boneless...do | 1,991,214 | 243,087 |
| Lengthwise...do | 81,160 | 4,367 |
| Medium scaled...do | 373,538 | 32,931 |
| Kippered...do | 223,922 | 39,692 |
| Unclassified, whole...do | 92,900 | 9,100 |
| Canned, "sardines"...standard cases | 671,635 | 2,367,045 |
| Meal...tons | 17,747 | 592,588 |
| Oil...gallons | 4,579,565 | 1,298,837 |
| Hogchoker, salted...pounds | 11,000 | 500 |
| King mackerel, smoked...do | 3,050 | 805 |
| Lake trout: | | |
| Fresh fillets...do | 74,038 | 23,453 |
| Smoked...do | 748,044 | 222,217 |
| "Lingcod," fresh fillets...do | 298,486 | 36,459 |
| Mackerel: | | |
| Fresh fillets...do | 202,302 | 34,332 |
| Frozen fillets...do | 485,355 | 33,439 |
| Salted, split, dry...do | 1,788,664 | 157,883 |
| Smoked...do | 678,920 | 120,921 |
| Canned...standard cases | 965,629 | 2,896,220 |
| Meal...tons | 1,574 | 58,580 |
| Oil...gallons | 86,364 | 25,878 |
| Menhaden: | | |
| Acid scrap...tons | 21,814 | 418,936 |
| Dry scrap...do | 26,096 | 1,006,428 |
| Meal...do | 13,178 | 570,192 |
| Oil...gallons | 4,189,129 | 1,173,667 |
| Mullet: | | |
| Salted...pounds | 1,904,000 | 118,822 |
| Roe, salted...do | 44,300 | 11,191 |
| Smoked...do | 48,300 | 9,362 |
| Paddlefish or spoonbill cat: | | |
| Smoked [3]...do | 276,200 | 168,833 |
| Roe, salted [4]...do | 1,595 | 812 |
| Pilchard: | | |
| Canned, "sardines"...standard cases | 2,261,678 | 7,102,358 |
| Meal...tons | 89,927 | 3,437,892 |
| Oil...gallons | 17,539,567 | 5,205,337 |

See footnotes at end of table.

*Manufactured fishery products of the United States and Alaska, 1938*—Continued

| Item | Quantity | Value |
|---|---|---|
| Pollock: | | |
| Fresh fillets ... pounds | 2,720,958 | $179,188 |
| Frozen fillets ... do | 10,570,535 | 562,142 |
| Salted: | | |
| Green [2] ... do | 438,911 | 11,805 |
| Dry ... do | 332,225 | 14,985 |
| Rockfishes, fresh fillets ... do | 1,176,237 | 182,985 |
| Rosefish: | | |
| Fresh fillets ... do | 6,066,632 | 478,197 |
| Frozen fillets ... do | 13,085,359 | 1,089,318 |
| Sablefish: | | |
| Kippered ... do | 689,024 | 81,680 |
| Pickled ... do | 100,364 | 4,167 |
| Salted ... do | 182,740 | 10,107 |
| Smoked [3] ... do | 184,840 | 47,270 |
| Sailfish, smoked ... do | 12,040 | 2,206 |
| Salmon: | | |
| Frozen steaks ... do | 158,305 | 38,177 |
| Dried ... do | 1,002,025 | 71,340 |
| Salted: | | |
| Dry ... do | 45,800 | 3,362 |
| Mild-cured ... do | 12,342,010 | 2,447,805 |
| Pickled ... do | 1,177,685 | 122,421 |
| Eggs for fish food ... do | 7,300 | 365 |
| Smoked [3] ... do | 9,049,520 | 2,692,296 |
| Kippered ... do | 2,728,875 | 468,980 |
| Canned: | | |
| Blueback, red, or sockeye ... standard cases | 2,671,396 | 21,707,727 |
| Chinook or king ... do | 214,868 | 2,775,910 |
| Chum or keta ... do | 845,353 | 3,064,549 |
| Humpback or pink ... do | 3,233,258 | 12,484,099 |
| Silver or coho ... do | 299,588 | 2,161,302 |
| Steelhead trout ... do | 15,256 | 172,202 |
| Caviar ... do | 1,563 | 28,077 |
| Eggs for bait ... do | 4,656 | 85,348 |
| Meal ... tons | 1,846 | 61,807 |
| Oil [5] ... gallons | 165,825 | 68,593 |
| Sauger: | | |
| Fresh fillets ... pounds | 1,089,164 | 231,257 |
| Frozen fillets ... do | 583,780 | 127,594 |
| Sea bass: | | |
| Fresh fillets (Atlantic) ... do | 94,000 | 13,880 |
| Fresh pan-dressed (Atlantic) ... do | 95,000 | 9,900 |
| Fresh steaks (black, Pacific) ... do | 210,000 | 33,600 |
| Fresh fillets (white, Pacific) ... do | 143,000 | 28,600 |
| Shad: | | |
| Smoked ... do | 185,425 | 37,696 |
| Canned ... standard cases | 10,845 | 29,950 |
| Canned, roe ... do | 3,015 | 95,909 |
| Sharks, including grayfish, fresh fillets ... pounds | 50,000 | 5,000 |
| Sharks: | | |
| Fins ... do | 41,870 | 17,248 |
| Skins ... do | 147,520 | 17,555 |
| Liver oil ... gallons | 129,705 | 330,397 |
| Sheepshead: | | |
| Fresh fillets ... pounds | 28,338 | 4,234 |
| Smoked [3] ... do | 37,517 | 4,015 |
| Snapper, red: | | |
| Fresh fillets ... do | 75,824 | 23,268 |
| Fresh steaks ... do | 14,000 | 3,110 |
| Spanish mackerel: | | |
| Fresh fillets ... do | 6,000 | 1,255 |
| Salted ... do | 88,000 | 4,973 |
| Smoked ... do | 950 | 178 |
| Spot, salted ... do | 201,600 | 10,559 |
| Squeteagues, or "sea trout": | | |
| Fresh fillets ... do | 279,500 | 36,995 |
| Fresh pan-dressed ... do | 365,000 | 25,800 |
| Salted ... do | 13,300 | 1,995 |
| Smoked ... do | 1,150 | 257 |
| Sturgeon: | | |
| Smoked and kippered [3] ... do | 842,683 | 570,632 |
| Roe, salted [3] ... do | 343 | 335 |
| Caviar, canned ... standard cases | 2,491 | 307,298 |
| Suckers, smoked ... pounds | 1,500 | 150 |
| Swellfish, fresh sticks ... do | 5,000 | 500 |
| Swordfish, fresh steaks ... do | 116,400 | 28,280 |
| Totuava, fresh steaks ... do | 1,790,000 | 358,000 |

See footnotes at end of table.

*Manufactured fishery products of the United States and Alaska, 1938*—Continued

| Item | | Quantity | Value |
|---|---|---|---|
| Tuna and tuna-like fishes: | | | |
| Canned: | | | |
| Albacore | standard cases | 384,185 | $2,310,733 |
| Bluefin | do | 333,374 | 1,694,896 |
| Bonito | do | 157,979 | 676,595 |
| Striped | do | 348,254 | 1,729,108 |
| "Tonno" | do | 140,400 | 946,725 |
| Yellowfin | do | 1,306,132 | 7,461,671 |
| Yellowtail | do | 83,819 | 363,908 |
| Meal | tons | 9,650 | 350,631 |
| Oil | gallons | 192,515 | 55,654 |
| Wahoo, smoked | pounds | 600 | 40 |
| White bass, fresh fillets | do | 22,143 | 4,093 |
| Whitefish: | | | |
| Fresh fillets | do | 40,865 | 14,935 |
| Smoked [3] | do | 1,839,539 | 493,819 |
| Caviar, canned | standard cases | 1,052 | 36,478 |
| Whiting: | | | |
| Fresh fillets | pounds | 346,646 | 25,787 |
| Frozen fillets | do | 830,615 | 71,752 |
| Frozen sticks | do | 1,173,794 | 71,665 |
| Frozen pan-dressed | do | 5,251,639 | 192,662 |
| Smoked | do | 1,200 | 240 |
| Wolffish: | | | |
| Fresh fillets | do | 78,537 | 7,894 |
| Frozen fillets | do | 130,200 | 13,634 |
| Yellow perch: | | | |
| Fresh fillets | do | 855,299 | 193,285 |
| Frozen fillets | do | 105,812 | 24,509 |
| Yellow pike: | | | |
| Fresh fillets | do | 344,859 | 76,618 |
| Frozen fillets | do | 83,899 | 15,723 |
| Smoked | do | 2,000 | 400 |
| Crabs, hard: | | | |
| Meat, packaged, fresh-cooked | do | 9,356,122 | 2,872,532 |
| Canned | standard cases | 13,037 | 249,268 |
| Dry scrap | tons | 1,515 | 25,135 |
| Crab, king, Pacific, canned | standard cases | 506 | 9,747 |
| Crab, king, "horseshoe": | | | |
| Meal | tons | 123 | 4,215 |
| Dry scrap | do | 255 | 9,689 |
| Lobsters, common, meat, packaged, fresh-cooked | pounds | 212,529 | 228,709 |
| Shrimp: | | | |
| Frozen packaged | do | 3,348,500 | 457,709 |
| Cooked and peeled | do | 1,478,522 | 451,269 |
| Sun-dried | do | 2,037,209 | 359,177 |
| Smoked | do | 375 | 113 |
| Canned | standard cases | 1,077,003 | 4,872,393 |
| Bran or meal | tons | 1,596 | 33,163 |
| Abalone steaks | pounds | 429,343 | 151,666 |
| Clams, hard: | | | |
| Fresh-shucked | gallons | 27,194 | 45,565 |
| Canned: | | | |
| Whole | standard cases | 20,935 | 98,337 |
| Minced | do | 20,885 | 116,059 |
| Chowder | do | 428,321 | 1,547,780 |
| Juice | do | 8,329 | 33,596 |
| Broth bouillon, and cocktail | do | 8,627 | 35,618 |
| Shells, ground, poultry food | tons | 3,019 | 23,524 |
| Clams, razor: | | | |
| Fresh-shucked | gallons | 28,280 | 11,443 |
| Canned: | | | |
| Whole | standard cases | 3,402 | 27,514 |
| Minced | do | 87,019 | 688,228 |
| Clams, soft: | | | |
| Fresh-shucked | gallons | 569,714 | 722,204 |
| Pickled | do | 80 | 160 |
| Canned: | | | |
| Whole | standard cases | 119,622 | 439,472 |
| Chowder | do | 48,274 | 156,953 |
| Juice | do | 23,151 | 41,267 |
| Steamed [2] | pounds | 272,745 | 21,238 |
| Clams, mixed, fresh-shucked | gallons | 1,392 | 1,740 |
| Marine-shell products: | | | |
| Buttons | gross | 6,228,339 | 3,642,893 |
| Novelties | | | 554,610 |
| Mussel-shell, fresh-water, products: | | | |
| Buttons | gross | 10,022,452 | 2,639,504 |
| Novelties | | | 15,400 |
| Poultry feed | tons | 4,446 | 25,845 |
| Lime | do | 1,111 | 1,140 |

See footnotes at end of table.

*Manufactured fishery products of the United States and Alaska, 1938*—Continued

| Item | Quantity | Value |
|---|---|---|
| Oysters: | | |
| Eastern: | | |
| Fresh-shucked ... gallons | 6,069,052 | $7,930,138 |
| Canned ... standard cases | 371,093 | 1,422,101 |
| Pacific: | | |
| Fresh-shucked ... gallons | 377,763 | 417,031 |
| Canned ... standard cases | 111,348 | 464,375 |
| Western or native, fresh-shucked ... gallons | 27,473 | 216,642 |
| Shell products: | | |
| Poultry feed ... tons | 258,431 | 1,075,709 |
| Lime and dust ... do | 61,461 | 213,636 |
| Lime, burned ... do | 14,789 | 93,338 |
| Scallops: | | |
| Bay, fresh-shucked ... gallons | 122,133 | 362,858 |
| Sea, fresh-shucked ... do | 990,066 | 1,082,131 |
| Alligator hides ... pounds | 88,356 | 7,363 |
| Whale products: | | |
| Meal (meat) ... tons | 396 | 15,796 |
| Meal (bone) ... do | 216 | 5,618 |
| Oil, whale ... gallons | 7,559,100 | 3,129,488 |
| Oil, sperm ... do | 181,900 | 54,570 |
| Unclassified products: | | |
| Fillets, fresh ... pounds | [6] 68,200 | [6] 7,884 |
| Fillets, frozen ... do | [7] 304,766 | [7] 45,275 |
| Pan-dressed, fresh ... do | [8] 40,000 | [8] 2,780 |
| Other packaged, fresh and frozen ... do | [9] 299,716 | [9] 28,632 |
| Salted, including spiced ... do | [10] 1,908,675 | [10] 145,119 |
| Smoked ... do | [11] 50,901 | [11] 7,666 |
| Canned: | | |
| Fish for cat and dog food ... standard cases | 413,434 | 888,399 |
| Fish cakes, balls, etc ... do | 97,263 | 665,307 |
| Fish flakes ... do | 45,721 | 291,426 |
| Fish paste ... do | 3,987 | 143,147 |
| Other ... do | [12] 55,041 | [12] 440,007 |
| Scrap, miscellaneous, dry and green ... tons | [13] 1,435 | [13] 38,101 |
| Meal: | | |
| Groundfish ... do | 7,725 | 364,250 |
| Miscellaneous ... do | [14] 10,123 | [14] 425,142 |
| Oil: | | |
| Fur seal ... gallons | 29,865 | 4,157 |
| Miscellaneous ... do | [15] 86,817 | [15] 28,906 |
| Miscellaneous liver ... do | [16] 114,942 | [16] 1,980,960 |
| Glue ... do | 383,769 | 805,804 |
| Other byproducts | [17] 86,353 | [17] 505,983 |
| Total, fresh and frozen packaged products ... pounds | 216,661,255 | 27,243,645 |
| Total, cured products ... do | 102,617,256 | 14,865,530 |
| Total, canned products ... do | 667,527,840 | 83,445,889 |
| Total, byproducts | | 30,576,367 |
| Grand total | | 156,131,431 |

[1] All data are for 1938 except for a small quantity of salted and smoked fish produced in the Mississippi River section which are for 1931.

[2] This is usually an intermediate product and although shown in the total may also be shown in its final stage of processing elsewhere in the table.

[3] Data are for 1938 and 1931.

[4] Data are for 1931.

[5] Includes the production of both edible and industrial salmon oil.

[6] Includes fresh fillets of red drum, sablefish, scup, sea robin, striped bass, suckers and swellfish.

[7] Includes frozen fillets of croaker, halibut, lake herring, king whiting, lake trout, "lingcod," salmon, red snapper, Spanish mackerel, squeteagues, white bass, and whitefish.

[8] Includes fresh pan-dressed king whiting, scup, and Spanish mackerel.

[9] Includes fresh steaks of cod, sea bass, red snapper, swordfish, and wolffish; frozen steaks of cod, grouper, haddock, and pollock; fresh pollock sticks; and fresh packaged sea crawfish meat.

[10] Includes dry salted barracuda, cusk, haddock, and sea bass; green salted haddock; salted boneless haddock and pollock; salted crevalle, mackerel, mackerel fillets, pilchard, salmon eggs, salmon bellies and tuna; mild-cured shad; and spiced chubs and lake herring.

[11] Includes smoked alewives with roe, pollock fillets, barracuda, cod, red drum, flounders, haddock, halibut, mooneye, scup and tuna.

[12] Includes canned salted cod, kippered sturgeon, pickled eels, haddock chowder, swordfish, tuna roe, soft crabs, shrimp soup, hard clam stew, razor clam juice, coquina clam broth, pickled sea mussels, oyster soup, smoked oysters, squid, crayfish bisque, fish chowder, groundfish roe, rat poison bait, crab and shrimp gumbo, fish bouillon, shore dinners, shellfish newberg; and turtle, terrapin, and frog products.

[13] Includes alewife, herring, shark, and miscellaneous dry scrap; and miscellaneous green scrap.

[14] Includes alewife, rosefish, salmon egg, shark, clam, starfish, and miscellaneous fish meal.

[15] Includes rosefish, shark and miscellaneous fish oil.

[16] Includes burbot, halibut, tuna, sablefish, swordfish, and miscellaneous liver oil. A small amount of halibut viscera oil is also included.

[17] Includes herring pomace, pearl essence, lime from crushed clam shells, fresh-water mussel-shell products, isinglass, and kelp products.

NOTE.—Some of the above products have been manufactured from raw products imported from another country; therefore, they cannot be correlated directly with the catch within the United States and Alaska.

## CANNED FISHERY PRODUCTS AND BYPRODUCTS TRADE

The output of canned fishery products and byproducts in the United States and Alaska in 1938 was valued at $114,022,256. Of this total, canned products comprised $83,445,889, and byproducts $30,576,367; a decrease of 21 percent in the value of canned products and 17 percent in the value of byproducts when compared with the respective values of the same groups of commodities for the previous year.

Fishery products were canned at 382 establishments in the United States and Alaska during 1938. The combined output of these canneries amounted to 17,004,379 standard cases. The net weight of the products canned amounted to 667,527,840 pounds.

Canned fishery products or byproducts were prepared in 26 States and in Alaska during 1938. Alaska ranked first in the value of the products, accounting for 34 percent of the total, and California ranked second, with 31 percent.

*Canned fishery products and byproducts of the United States and Alaska, 1938*

SUMMARY OF PRODUCTION: BY COMMODITIES

| Product | Number of plants | Standard cases | Pounds | Value |
|---|---|---|---|---|
| Canned products: | | | | |
| Salmon: | | | | |
| United States | 27 | 472, 721 | 22, 690, 608 | $5, 728, 892 |
| Alaska | 98 | 6, 806, 998 | 326, 735, 904 | 36, 636, 897 |
| Sardines: | | | | |
| Maine | 25 | 671, 635 | 16, 790, 875 | 2, 367, 045 |
| California | 31 | 2, 261, 678 | 108, 560, 544 | 7, 102, 358 |
| Tuna and tunalike fishes | 20 | 2, 754, 143 | 66, 099, 432 | 15, 183, 636 |
| Mackerel | 24 | 965, 629 | 46, 350, 192 | 2, 896, 220 |
| Alewives | 10 | 52, 826 | 2, 535, 648 | 143, 558 |
| Alewife roe | 29 | 37, 641 | 1, 806, 768 | 165, 711 |
| Shad | 8 | 10, 845 | 520, 560 | 29, 950 |
| Shad roe | 10 | 3, 015 | 144, 720 | 95, 909 |
| Cat and dog food | 9 | 413, 434 | 19, 844, 832 | 888, 399 |
| Fish flakes | 4 | 45, 721 | 2, 191, 608 | 291, 426 |
| Finnan haddie | 3 | 488 | 23, 424 | 7, 518 |
| Fish cakes, balls, etc | 6 | 97, 263 | 4, 668, 624 | 665, 307 |
| Fish paste | 3 | 3, 987 | 191, 376 | 143, 147 |
| Sturgeon caviar | 4 | 2, 491 | 119, 568 | 307, 298 |
| Whitefish roe and caviar | 5 | 1, 052 | 50, 496 | 36, 478 |
| Salmon roe and caviar (for food) | 4 | 1, 563 | 75, 024 | 28, 077 |
| Salmon eggs (for bait) | 8 | 4, 656 | 223, 488 | 85, 348 |
| Miscellaneous fish and roe | 14 | 19, 792 | 950, 016 | 182, 729 |
| Clam products | 60 | [1] 769, 665 | 19, 312, 005 | 3, 189, 628 |
| Oysters | 42 | 482, 441 | 7, 236, 615 | 1, 886, 476 |
| Shrimp | 50 | 1, 077, 003 | 18, 113, 297 | 4, 872, 393 |
| Crabs | 21 | 13, 699 | 657, 552 | 260, 134 |
| Turtle products | 4 | 7, 410 | 355, 680 | 80, 869 |
| Miscellaneous shellfish, etc | 14 | 26, 583 | 1, 275, 984 | 170, 486 |
| Total | [2] 382 | 17, 004, 379 | 667, 527, 840 | 83, 445, 889 |

| Byproducts: | | *Quantity* | *Value* |
|---|---|---|---|
| Oyster and marine clam-shell products | tons | 339, 425 | $1, 416, 557 |
| Fresh-water mussel-shell products | | | 2, 698, 879 |
| Marine pearl-shell products | | | 4, 197, 503 |
| Scrap, meal, etc | tons | 205, 216 | 7, 418, 163 |
| Marine animal oils | gallons | 35, 140, 135 | 13, 526, 015 |
| Liquid glue | do | 383, 769 | 805, 804 |
| Miscellaneous byproducts | | | 513, 446 |
| Total | | | 30, 576, 367 |
| Grand total | | | 114, 022, 256 |

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[1] "Cut-out" or "drained" weights of can contents are included for whole or minced clams and gross can contents for other clam products.

[2] Exclusive of duplication.

*Canned fishery products and byproducts of the United States and Alaska, 1938*—Con.

VALUE OF PRODUCTION: BY STATES

| State | Canned products | Byproducts | Total |
|---|---|---|---|
| Maine | $3,319,212 | $340,060 | $3,659,272 |
| Massachusetts | 1,354,127 | 2,106,003 | 3,478,545 |
| Rhode Island | | 18,415 | |
| Connecticut | | 1,010,609 | 1,010,609 |
| New York | 564,267 | 4,586,870 | 5,151,137 |
| New Jersey | 1,215,126 | 1,692,644 | 3,020,702 |
| Pennsylvania | | 112,932 | |
| Delaware | 506,476 | 364,179 | 1,862,872 |
| Maryland | | 992,217 | |
| Virginia | 104,502 | 1,085,618 | 1,190,120 |
| North Carolina | 65,028 | 1,099,679 | 1,476,915 |
| South Carolina | 312,208 | | |
| Georgia | 743,663 | 716,599 | 1,808,176 |
| Florida | 347,914 | | |
| Alabama and Mississippi | 1,917,637 | 77,135 | 1,994,772 |
| Louisiana | 2,776,572 | 349,511 | 3,126,083 |
| Texas, Illinois, Missouri, Wisconsin, and Minnesota | 525,928 | 169,926 | 695,854 |
| Iowa | | 2,169,263 | 2,169,263 |
| Washington | 3,762,575 | 1,444,398 | 5,206,973 |
| Oregon | 3,638,815 | 368,415 | 4,007,230 |
| California | 25,232,688 | 9,798,607 | 35,031,295 |
| Alaska | 37,059,151 | 2,073,287 | 39,132,438 |
| Total | 83,445,889 | 30,576,367 | 114,022,256 |

PACK OF CANNED SALMON: STANDARD CASES

| Product | Alaska | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Southeastern | | Central | | Western | | Total | |
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| Chinook or king: | | | | | | | | |
| 1-pound tall | 13,641 | $93,458 | 15,488 | $103,975 | 6,219 | $45,138 | 35,348 | $242,571 |
| 1-pound flat | 1,450 | 11,890 | 4,381 | 40,887 | 280 | 2,580 | 6,111 | 55,357 |
| ½-pound flat | 1,279 | 13,325 | 1,075 | 17,390 | | | 2,354 | 30,715 |
| Total | 16,370 | 118,673 | 20,944 | 162,252 | 6,499 | 47,718 | 43,813 | 328,643 |
| Blueback, red, or sockeye: | | | | | | | | |
| 1-pound tall | 125,542 | 911,488 | 384,267 | 2,850,896 | 1,828,605 | 13,928,747 | 2,338,414 | 17,691,131 |
| 1-pound flat | 13,247 | 116,386 | 38,361 | 318,542 | | | 51,608 | 434,928 |
| ½-pound flat | 53,802 | 598,554 | 50,618 | 578,628 | 18,222 | 216,029 | 122,642 | 1,393,211 |
| 4-pound flat | | | 8,569 | 64,527 | | | 8,569 | 64,527 |
| Total | 192,591 | 1,626,428 | 481,815 | 3,812,593 | 1,846,827 | 14,144,776 | 2,521,233 | 19,583,797 |
| Silver or coho: | | | | | | | | |
| 1-pound tall | 132,147 | 807,301 | 69,839 | 428,613 | 345 | 1,937 | 202,331 | 1,237,851 |
| 1-pound flat | 2,688 | 18,816 | 157 | 1,072 | | | 2,845 | 19,888 |
| ½-pound flat | 8,930 | 84,746 | 3,092 | 27,921 | | | 12,022 | 112,667 |
| 4-pound flat | | | 5,123 | 28,905 | | | 5,123 | 28,905 |
| Total | 143,765 | 910,863 | 78,211 | 486,511 | 345 | 1,937 | 222,321 | 1,399,311 |
| Humpback or pink: | | | | | | | | |
| 1-pound tall | 1,845,078 | 7,094,557 | 1,318,415 | 5,006,070 | | | 3,163,493 | 12,100,627 |
| 1-pound flat | | | 4,105 | 18,317 | | | 4,105 | 18,317 |
| ½-pound flat | 41,691 | 250,497 | 9,091 | 57,515 | | | 50,782 | 308,012 |
| 4-pound flat | | | 14,498 | 54,767 | | | 14,498 | 54,767 |
| Total | 1,886,769 | 7,345,054 | 1,346,109 | 5,136,669 | | | 3,232,878 | 12,481,723 |
| Chum or keta: | | | | | | | | |
| 1-pound tall | 469,306 | 1,681,816 | 250,046 | 907,034 | 59,614 | 216,171 | 778,966 | 2,805,021 |
| ½-pound flat | 5,147 | 28,969 | 376 | 2,105 | | | 5,523 | 31,074 |
| 4-pound flat | | | 2,264 | 7,328 | | | 2,264 | 7,328 |
| Total | 474,453 | 1,710,785 | 252,686 | 916,467 | 59,614 | 216,171 | 786,753 | 2,843,423 |
| Grand total | 2,713,948 | 11,711,803 | 2,179,765 | 10,514,492 | 1,913,285 | 14,410,602 | 6,806,998 | 36,636,897 |

*Canned fishery products and byproducts of the United States and Alaska, 1938*—Con.

PACK OF CANNED SALMON: STANDARD CASES—Continued

| Product | United States | | | | | | Grand total, United States and Alaska | |
|---|---|---|---|---|---|---|---|---|
| | Washington | | Oregon | | Total | | | |
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| Chinook or King: | | | | | | | | |
| 1-pound tall | 905 | $4,696 | 1,953 | $9,783 | 2,858 | $14,479 | 38,206 | $257,050 |
| 1-pound oval | 24 | 528 | 572 | 12,584 | 596 | 13,112 | 596 | 13,112 |
| 1-pound flat | 5,334 | 59,446 | 21,936 | 239,661 | 27,270 | 299,107 | 33,381 | 354,464 |
| ½-pound oval | 3 | 80 | 150 | 4,020 | 153 | 4,100 | 153 | 4,100 |
| ½-pound flat | 23,474 | 337,791 | 106,278 | 1,612,677 | 129,752 | 1,950,468 | 132,106 | 1,981,183 |
| ¼-pound flat | 213 | 2,215 | 10,213 | 163,786 | 10,426 | 166,001 | 10,426 | 166,001 |
| Total | 29,953 | 404,756 | 141,102 | 2,042,511 | 171,055 | 2,447,267 | 214,868 | 2,775,910 |
| Blueback, red, or sockeye: | | | | | | | | |
| 1-pound tall | 563 | 5,067 | | | 563 | 5,067 | 2,338,977 | 17,696,198 |
| 1-pound flat | 30,359 | 346,093 | | | 30,359 | 346,093 | 81,967 | 781,021 |
| ½-pound flat | 106,834 | 1,543,092 | 9,231 | 166,158 | 116,065 | 1,709,250 | 238,707 | 3,102,461 |
| ¼-pound flat | 476 | 9,520 | 2,700 | 54,000 | 3,176 | 63,520 | 3,176 | 63,520 |
| 4-pound flat | | | | | | | 8,569 | 64,527 |
| Total | 138,232 | 1,903,772 | 11,931 | 220,158 | 150,163 | 2,123,930 | 2,671,396 | 21,707,727 |
| Silver or coho: | | | | | | | | |
| 1-pound tall | 29 | 186 | 78 | 499 | 107 | 685 | 202,438 | 1,238,536 |
| 1-pound flat | 2,872 | 21,253 | 13,967 | 111,736 | 16,839 | 132,989 | 19,684 | 152,877 |
| ½-pound flat | 10,594 | 101,702 | 34,153 | 321,038 | 44,747 | 422,740 | 56,769 | 535,407 |
| ¼-pound flat | | | 15,574 | 205,577 | 15,574 | 205,577 | 15,574 | 205,577 |
| 4-pound flat | | | | | | | 5,123 | 28,905 |
| Total | 13,495 | 123,141 | 63,772 | 638,850 | 77,267 | 761,991 | 299,588 | 2,161,302 |
| Humpback or pink: | | | | | | | | |
| 1-pound tall | 13 | 55 | | | 13 | 55 | 3,163,506 | 12,100,682 |
| 1-pound flat | 17 | 81 | | | 17 | 81 | 4,122 | 18,398 |
| ½-pound flat | 350 | 2,240 | | | 350 | 2,240 | 51,132 | 310,252 |
| 4-pound flat | | | | | | | 14,498 | 54,767 |
| Total | 380 | 2,376 | | | 380 | 2,376 | 3,233,258 | 12,484,099 |
| Chum or keta: | | | | | | | | |
| 1-pound tall | 22,786 | 82,576 | 31,004 | 111,614 | 53,790 | 194,190 | 832,756 | 2,999,211 |
| ½-pound flat | 2,272 | 12,723 | 2,538 | 14,213 | 4,810 | 26,936 | 10,333 | 58,010 |
| 4-pound flat | | | | | | | 2,264 | 7,328 |
| Total | 25,058 | 95,299 | 33,542 | 125,827 | 58,600 | 221,126 | 845,353 | 3,064,549 |
| Steelhead: | | | | | | | | |
| 1-pound flat | 601 | 4,808 | 1,621 | 12,968 | 2,222 | 17,776 | 2,222 | 17,776 |
| ½-pound oval | | | 2,535 | 35,490 | 2,535 | 35,490 | 2,535 | 35,490 |
| ½-pound flat | 670 | 6,700 | 5,471 | 54,710 | 6,141 | 61,410 | 6,141 | 61,410 |
| ¼-pound flat | 340 | 4,488 | 4,018 | 53,038 | 4,358 | 57,526 | 4,358 | 57,526 |
| Total | 1,611 | 15,996 | 13,645 | 156,206 | 15,256 | 172,202 | 15,256 | 172,202 |
| Grand total | 208,729 | 2,545,340 | 263,992 | 3,183,552 | 472,721 | 5,728,892 | 7,279,719 | 42,365,789 |

NOTE.—"Standard cases" represents the various sized cases converted to the equivalent of forty-eight 1-pound cans to the case. Salmon were canned at 21 plants in Washington, 6 in Oregon, and 98 in Alaska.

*Canned fishery products and byproducts of the United States and Alaska, 1938*—Con.

PACK OF CANNED SARDINES

| Sardines (herring) | Maine | |
|---|---|---|
| | *Cases* | *Value* |
| Quarters, ¼ pound (100 cans): | | |
| In olive oil | 1, 654 | $9, 362 |
| In cottonseed oil | 562, 640 | 2, 018, 613 |
| In mustard | 56, 267 | 222, 117 |
| In tomato sauce | 3, 914 | 16, 764 |
| Three-quarters, ¾ pound (48 cans): | | |
| In mustard | 32, 750 | 100, 189 |
| Total | 657, 225 | 2, 367, 045 |
| Total (standard cases) | 671, 635 | ---------- |

| Sardines (pilchard) | California | |
|---|---|---|
| | *Cases* | *Value* |
| 1 pound: | | |
| Oval: | | |
| In mustard (48 cans) | 222, 069 | $673, 768 |
| In tomato sauce (48 cans) | 1, 047, 044 | 3, 165, 642 |
| In natural oil (48 cans) | 38, 399 | 111, 815 |
| Tall: | | |
| In natural oil (48 cans) | 382, 270 | 884, 394 |
| Oval and tall: | | |
| In other sauces and oils (48 cans) | 12, 627 | 40, 798 |
| ½ pound: | | |
| 8 Z short: | | |
| In tomato sauce (96 cans) | 9, 860 | 28, 451 |
| In natural oil (96 cans) | 266, 810 | 772, 698 |
| Flat, oval, oblong and 8 Z short: | | |
| In various sauces and oils (48 cans) | 136, 160 | 337, 415 |
| 5-ounce tall: | | |
| In tomato sauce (100 cans) | 30, 115 | 94, 657 |
| In natural oil (100 cans) | 270, 886 | 783, 081 |
| Other sizes: | | |
| In various sauces and oils (standard cases) | 18, 568 | 209, 639 |
| Total | 2, 434, 808 | 7, 102, 358 |
| Total (standard cases) | 2, 261, 678 | ---------- |

NOTE.—"Standard Cases" represents the various sized cases converted to the uniform basis of one-hundred ¼-pound cans to the case of sardines (herring), and forty-eight 1-pound cans to the case of sardines (pilchard).

Sardines were canned at 25 plants in Maine and 31 in California.

PACK OF CANNED TUNA AND TUNALIKE FISHES

| Product and size | Albacore | | Yellowfin | | Bluefin | | Striped | |
|---|---|---|---|---|---|---|---|---|
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| ¼-pound (48 cans) | 29, 883 | $118, 206 | 198, 472 | $781, 977 | 33, 432 | $120, 599 | 20, 391 | $71, 265 |
| ¼-pound (100 cans) | (3) | (3) | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- |
| ½-pound (48 cans) | [3] 273,802 | [3] 1,714, 572 | 887, 059 | 5, 151, 739 | 265, 036 | 1, 346, 944 | 287, 362 | 1, 435, 646 |
| 1-pound (48 cans) | [4] 22, 490 | [4] 251, 901 | 84, 878 | 890, 452 | 16, 187 | 147, 554 | [4] 19, 046 | [4] 170, 242 |
| 4-pound (12 cans) | (4) | (4) | 2, 522 | 33, 761 | ---------- | ---------- | (4) | (4) |
| Total (actual cases) | 326, 175 | 2, 084, 679 | 1, 172, 931 | 6, 857, 929 | 314, 655 | 1, 615, 097 | 326, 799 | 1, 677, 153 |
| Total (standard cases) | 333, 723 | ---------- | 1, 161, 095 | ---------- | 314, 125 | ---------- | 335, 650 | ---------- |
| Flakes: | | | | | | | | |
| ½-pound (48 cans) | 34, 664 | 162, 090 | [5] 118, 129 | [5] 503, 346 | 15, 390 | 66, 722 | [6] 12, 604 | [6] 51, 955 |
| 1-pound (48 cans) | [7] 7, 899 | [7] 63, 964 | [7] 13, 454 | [7] 100, 396 | [7] 1, 929 | [7] 13, 077 | (6) | (6) |
| Total (actual cases) | 42, 563 | 226, 054 | 131, 583 | 603, 742 | 17, 319 | 79, 799 | 12, 604 | 51, 955 |
| Total (standard cases) | 50, 462 | ---------- | 145, 037 | ---------- | 19, 249 | ---------- | 12, 604 | ---------- |
| Grand total (actual cases) | 368, 738 | 2, 310, 733 | 1, 304, 514 | 7, 461, 671 | 331, 974 | 1, 694, 896 | 339, 403 | 1, 729, 108 |
| Grand total (standard cases) | 384, 185 | ---------- | 1, 306, 132 | ---------- | 333, 374 | ---------- | 348, 254 | ---------- |

See footnotes at end of table.

*Canned fishery products and byproducts of the United States and Alaska, 1938*—Con.

PACK OF CANNED TUNA AND TUNALIKE FISHES—Continued

| Product and size | "Tonno" | | Bonito | | Yellowtail | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| ¼-pound (48 cans) | | | (5) | (5) | | | 282, 178 | $1, 092, 047 |
| ¼-pound (100 cans) | 119, 604 | $846, 356 | [5] 4, 078 | [5] $25, 573 | (3) | (3) | 123, 682 | 871, 929 |
| ½-pound (48 cans) | [8] 15, 820 | [8] 100, 369 | 87, 275 | 385, 540 | [3] 51, 293 | [3] $233, 241 | 1, 867, 647 | 10, 368, 051 |
| 1-pound (48 cans) | | | 33, 228 | 265, 482 | 16, 263 | 130, 667 | 192, 092 | 1, 856, 298 |
| 4-pound (12 cans) | (8) | (8) | | | | | 2, 522 | 33, 761 |
| Total (actual cases) | 135, 424 | 946, 725 | 124, 581 | 676, 595 | 67, 556 | 363, 908 | 2, 468, 121 | 14, 222, 086 |
| Total (standard cases) | 140, 400 | | 157, 979 | | 83, 819 | | 2, 526, 791 | |
| Flakes: | | | | | | | | |
| ½-pound (48 cans) | | | | | | | 180, 787 | 784, 113 |
| 1-pound (48 cans) | | | | | | | 23, 282 | 177, 437 |
| Total (actual cases) | | | | | | | 204, 069 | 961, 550 |
| Total (standard cases) | | | | | | | 227, 352 | |
| Grand total (actual cases) | 135, 424 | 946, 725 | 124, 581 | 676, 595 | 67, 556 | 363, 908 | 2, 672, 190 | 15, 183, 636 |
| Grand total (standard cases) | 140, 400 | | 157, 979 | | 83, 819 | | 2, 754, 143 | |

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[3] The pack in ¼-pound cans, 100 to the case, has been converted to the equivalent of ½-pound cans, 48 to the case.

[4] The pack in 4-pound cans, 12 to the case, has been converted to the equivalent of 1-pound cans, 48 to the case.

[5] The pack in ¼-pound cans, 48 to the case, has been converted to the equivalent of ½-pound cans, 48 to the case.

[6] The pack of creamed tuna in ¾-pound cans, 48 to the case, and tuna flakes in 1-pound cans, 48 to the case, have been converted to the equivalent of ½-pound cans, 48 to the case.

[7] The pack of creamed tuna in ¾-pound cans, 48 to the case, has been converted to the equivalent of 1-pound cans, 48 to the case.

[8] The pack in 4-pound cans, 12 to the case, has been converted to the equivalent of ½-pound cans, 48 to the case.

NOTE.—"Standard cases" represents the various sized cases converted to the equivalent of 48 ½-pound cans to the case. Tuna and tunalike fishes were canned at 15 plants in California, 1 in Washington, 3 in Oregon, and 1 in Massachusetts. The pack of all varieties of tuna and tunalike fishes in California amounted to 2,673,516 standard cases, valued at $14,686,677, while the pack of albacore tuna in Washington and Oregon, and bluefin tuna in Massachusetts, totaled 80,627 standard cases, valued at $496,959.

PACK OF CANNED MACKEREL

| Size | Cases | Value |
|---|---|---|
| 8-ounce (48 cans) | 10, 421 | $28, 849 |
| 8-ounce (96 cans) | 41, 869 | 135, 923 |
| 16-ounce (48 cans) | 902, 656 | 2, 592, 232 |
| Other sizes (standard cases) | 15, 893 | 139, 216 |
| Total (actual cases) | 970, 839 | 2, 896, 220 |
| Total (standard cases) | 965. 629 | |

NOTE.—"Standard cases" represents the various sized cans converted to the equivalent of 48 1-pound cans to the case. Mackerel were canned at 2 plants in Massachusetts, and 22 in California.

PACK OF CANNED ALEWIVES AND ALEWIFE ROE: STANDARD CASES

| Product | Maine, Massachusetts, Delaware, and Virginia | | Maryland | | North Carolina | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| Alewives | 21, 064 | $50, 492 | 31, 762 | $93, 066 | | | 52, 826 | $143, 558 |
| Alewife roe | 16, 971 | 70, 897 | 12, 132 | 57, 661 | 8, 538 | $37, 153 | 37, 641 | 165, 711 |
| Total | 38, 035 | 121, 389 | 43, 894 | 150, 727 | 8, 538 | 37, 153 | 90, 467 | 309, 269 |

*Canned fishery products and byproducts of the United States and Alaska, 1938*—Con.

PACK OF CANNED ALEWIVES AND ALEWIFE ROE: ACTUAL CASES

| Product and size | Cases | Value |
|---|---|---|
| Alewives: | | |
| 14, 16, 17, 19 ounces (24 cans) | [9] 73,027 | [9] $91,226 |
| 26 ounces (24 cans) | 24,343 | 52,332 |
| Total | | 143,558 |
| Alewife roe: | | |
| 8 ounces (48 cans) | 21,108 | 50,206 |
| 10, 14, 16, and 17 ounces (24 cans) | [10] 51,385 | [10] 115,565 |
| Total | | 165,771 |
| Grand total | | 309,329 |

[9] Consists principally of 14-ounce cans. Includes 4,450 cases of 48 cans to the case.
[10] Consists principally of 17-ounce cans.

NOTE.—"Standard cases" represents the various sized cases converted to the equivalent of 48 1-pound cans to the case. Alewives were canned at 1 plant in Massachusetts, 1 in Delaware, 5 in Maryland, and 3 in Virginia. Alewife roe was canned at 1 plant in Maine, 1 in Delaware, 7 in Maryland, 6 in North Carolina, and 14 in Virginia.

PACK OF CANNED OYSTERS: STANDARD CASES

| State | Cases | Value |
|---|---|---|
| New Jersey and Maryland | 4,967 | $20,482 |
| South Carolina | 79,811 | 297,818 |
| North Carolina and Florida | 16,791 | 60,450 |
| Alabama and Georgia | 28,167 | 105,440 |
| Mississippi | 180,328 | 714,712 |
| Louisiana | 61,029 | 223,199 |
| Washington and Oregon | 111,348 | 464,375 |
| Total | 482,441 | 1,886,476 |

PACK OF CANNED OYSTERS: ACTUAL CASES

| Size | Cases | Value |
|---|---|---|
| 3½-ounce (48 cans) | [11] 20,325 | [11] $68,361 |
| 4-ounce (48 cans) | 12,218 | 45,079 |
| 5-ounce (24 cans) | 104,379 | 193,541 |
| 5-ounce (48 cans) | 297,346 | 1,143,769 |
| 8-ounce (24 cans) | 13,090 | 48,609 |
| 8-ounce (48 cans) | 45,584 | 290,239 |
| 10-ounce (24 cans) | 25,498 | 96,878 |
| Total | | 1,886,476 |

[11] Includes the pack in 2-ounce cans, 100 to the case, which has been converted to the equivalent of 3½-ounce cans, 48 to the case.

NOTE.—"Standard cases" represents the various sized cases converted to the equivalent of 48 five-ounce cans to the case. Oysters were canned at 1 plant in New Jersey, 2 in Maryland, 1 in North Carolina, 5 in South Carolina, 1 in Georgia, 2 in Florida, 2 in Alabama, 13 in Mississippi, 8 in Louisiana, 5 in Washington, and 2 in Oregon. The pack of oyster soup and smoked oysters has not been included in the pack of oysters but has been shown under "Pack of Miscellaneous Canned Products."

*Canned fishery products and byproducts of the United States and Alaska, 1938*—Con.

PACK OF CANNED CLAMS AND CLAM PRODUCTS: STANDARD CASES

| Product and State | Whole | | Minced | | Chowder | | Juice, broth, and cocktail | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| Soft clams: | | | | | | | | | | |
| Maine, Massachusetts, and New Jersey | [12] 119, 622 | [12] $439, 472 | | | [13] 48, 274 | [13] $156, 953 | [14] 23, 151 | [14] $41, 267 | 191, 047 | $637, 692 |
| Hard clams: | | | | | | | | | | |
| Maryland and Florida | (15) | (15) | (16) | (16) | 13, 205 | 29, 113 | (17) | (17) | 13, 205 | 29, 113 |
| New Jersey | | | | | 179, 133 | 648, 776 | (17) | (17) | 179, 133 | 648, 776 |
| Washington | 16, 551 | 66, 080 | 12, 948 | $60, 356 | (18) | (18) | 2, 507 | 5, 876 | 32, 006 | 132, 312 |
| New York and Alaska | [15] 4, 384 | [15] 32, 257 | [16] 7, 937 | [16] 55, 703 | (18) | (18) | [17] 14, 926 | [17] 65, 650 | 27, 247 | 153, 610 |
| Massachusetts, Rhode Island, Pennsylvania, and Illinois | | | | | [18] 236, 518 | [18] 872, 031 | | | 236, 518 | 872, 031 |
| Total | 20, 935 | 98, 337 | 20, 885 | 116, 059 | 428, 856 | 1, 549, 920 | 17, 433 | 71, 526 | 488, 109 | 1, 835, 842 |
| Razor clams: | | | | | | | | | | |
| Washington and Oregon | 1, 879 | 15, 032 | 54, 698 | 449, 718 | | | 88 | 352 | 56, 665 | 465, 102 |
| Alaska | 1, 523 | 12, 482 | 32, 321 | 238, 510 | | | | | 33, 844 | 250, 992 |
| Total | 3. 402 | 27, 514 | 87, 019 | 688, 228 | | | 88 | 352 | 90, 509 | 716, 094 |
| Grand total | 143, 959 | 565, 323 | 107, 904 | 804, 287 | 477, 130 | 1, 706, 873 | 40, 672 | 113, 145 | 769, 665 | 3, 189, 628 |

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[12] Packed in Maine and New Jersey.

[13] Packed in Maine and Massachusetts.

[14] Packed in Maine.

[15] A small production of whole clams in Florida has been included with the New York and Alaska production.

[16] A small production of minced clams in Florida has been included with the New York and Alaska production.

[17] The production of hard clam juice in New Jersey and Florida, and broth from coquina clams produced in Florida, has been included with the New York and Alaska production.

[18] A small pack of hard clam chowder in Washington and New York has been included with the Massachusetts, Rhode Island, Pennsylvania, and Illinois production.

*Canned fishery products and byproducts of the United States and Alaska, 1938*—Con.

PACK OF CANNED CLAMS AND CLAM PRODUCTS: ACTUAL CASES

| Product and size | Whole | | Minced | | Chowder | | Juice, broth, and cocktail | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| Soft clams: | | | | | | | | | | |
| No. 1 (48 cans) | 89, 761 | $327, 698 | | | 15, 790 | $59, 532 | (19) | (19) | 105, 551 | $387, 230 |
| 1-pound (24 cans) | | | | | 9, 259 | 22, 333 | | | 9, 259 | 22, 333 |
| 1-pound (48 cans) | 8, 956 | 54, 292 | | | | | | | 8, 956 | 54, 292 |
| No. 2 (24 cans) | 11, 999 | 43, 810 | | | (19) | (19) | 11, 741 | $18, 978 | 23, 740 | 62, 788 |
| No. 10 (6 cans) | (19) | (19) | | | (19) | (19) | 1, 488 | 2, 334 | 1, 488 | 2, 334 |
| Other sizes (standard cases) | 3, 532 | 13, 672 | | | 25, 077 | 75, 088 | 9, 513 | 19, 955 | 38, 122 | 108, 715 |
| Total | | 439, 472 | | | | 156, 953 | | 41, 267 | | 637, 692 |
| Hard clams: | | | | | | | | | | |
| ½-pound (48 cans) | (19) | (19) | 12, 823 | $46, 191 | | | (19) | (19) | 12, 823 | 46, 191 |
| No. 1 (48 cans) | 1, 137 | 9, 155 | 2, 573 | 14, 465 | 231, 575 | 822, 942 | 2, 779 | 13, 853 | 238, 064 | 860, 415 |
| 1-pound (12 cans) | | | | | 178, 187 | 298, 553 | (19) | (19) | 178, 187 | 298, 553 |
| 1-pound (48 cans) | 2, 735 | 18, 682 | | | | | 269 | 1, 279 | 3, 004 | 19, 961 |
| No. 2 (24 cans) | 4, 419 | 26, 941 | | | | | | | 4, 419 | 26, 941 |
| No. 10 (6 cans) | 7, 708 | 35, 553 | (19) | (19) | 8, 082 | 31, 346 | 4, 796 | 23, 185 | 20, 586 | 90, 084 |
| Other sizes (standard cases) | 983 | 8, 006 | 8, 053 | 55, 403 | 115, 702 | 397, 079 | 8, 109 | 33, 209 | 132, 847 | 493, 697 |
| Total | | 98, 337 | | 116, 059 | | 1, 549, 920 | | 71, 526 | | 1, 835, 842 |
| Razor clams: | | | | | | | | | | |
| ½-pound (48 cans) | | | 86, 566 | 552, 144 | | | | | 86, 566 | 552, 144 |
| No. 1 (48 cans) | 3, 028 | 24, 958 | 17, 576 | 134, 895 | | | 88 | 352 | 20, 692 | 160, 205 |
| 1 lb. (48 cans) | 234 | 2, 556 | 119 | 1, 189 | | | | | 353 | 3, 745 |
| Total | | 27, 514 | | 688, 228 | | | 88 | 352 | | 716, 094 |
| Grand total | | 565, 323 | | 804, 287 | | 1, 706, 873 | | 113, 145 | | 3, 189, 628 |

[19] The production of this item has been included with "Other sizes (standard cases)."

NOTE.—"Standard cases" represents the various sized cases converted to the equivalent of 48 No. 1 cans. Soft clam products were canned at 19 plants in Maine, 2 in Massachusetts, and 1 in New Jersey; hard clam products, at 1 plant in Massachusetts, 1 in Rhode Island, 1 in New York, 3 in New Jersey, 1 in Pennsylvania, 2 in Maryland, 1 in Florida, 4 in Washington, 1 in Illinois, and 3 in Alaska; razor clam products, at 5 plants in Washington, 1 in Oregon, and 13 in Alaska; and coquina clam products, at 1 plant in Florida.

*Canned fishery products and byproducts of the United States and Alaska, 1938*—Con.

PACK OF CANNED SHRIMP: STANDARD CASES

| State | Dry pack (in tins) | | Wet pack (in tins) | | Wet pack (in glass) | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| Georgia | 21,700 | $101,192 | 95,646 | $418,197 | 25,139 | $206,368 | 142,485 | $725,757 |
| Florida | 5,867 | 26,963 | 10,536 | 45,605 | 15,803 | 128,108 | 32,206 | 200,676 |
| Alabama and Texas | 8,903 | 37,820 | 97,963 | 400,843 | ([20]) | ([20]) | 106,866 | 438,663 |
| Mississippi | 59,582 | 241,540 | 167,524 | 706,206 | | | 227,106 | 947,746 |
| Louisiana | 110,617 | 485,990 | 428,057 | 1,818,869 | [20] 29,666 | [20] 254,692 | 568,340 | 2,559,551 |
| Total | 206,669 | 893,505 | 799,726 | 3,389.720 | 70,608 | 589,168 | 1,077,003 | 4,872,393 |

PACK OF CANNED SHRIMP: ACTUAL CASES

| Size | Cases | Value |
|---|---|---|
| In tins, dry: | | |
| 4-ounce (48 cans) | 4,894 | $18,352 |
| 5-ounce (24 cans) | 4,507 | 9,580 |
| 5-ounce (48 cans) | 176,915 | 749,485 |
| 8¼-ounce (24 cans) | 28,588 | 116,088 |
| In tins, wet: | | |
| 4-ounce (48 cans) | 3,787 | 12,166 |
| 5¾-ounce (24 cans) | 98,448 | 223,549 |
| 5¾-ounce (48 cans) | 739,375 | 3,114,313 |
| 9¾-ounce (24 cans) | 2,913 | 11,551 |
| 32-ounce (12 cans) | 4,297 | 27,931 |
| In tins, wet—Continued. | | |
| Other sizes (standard cases) | 46 | $210 |
| In glass, wet: | | |
| 2½-ounce (48 jars) | 28,747 | 119,710 |
| 4-ounce (24 jars) | 10,793 | 32,789 |
| 5¾-ounce (24 jars) | 48,769 | 206,876 |
| 6-ounce (24 jars) | 57,450 | 229,793 |
| Total | | 4,872,393 |

[20] A small pack of shrimp in glass produced in Texas has been included with Louisiana production.

NOTE.—"Standard cases" represents the various sized cases converted to the equivalent of forty-eight 5-ounce cans to the case in the dry pack and forty-eight 5¾-ounce cans to the case in the wet pack. Shrimp were canned at 4 plants in Georgia, 5 in Florida, 2 in Alabama, 13 in Mississippi, 24 in Louisiana, and 2 in Texas.

PACK OF MISCELLANEOUS CANNED FISHERY PRODUCTS: STANDARD CASES

| Product | Atlantic and Gulf coasts [21] | | Pacific coast (including Alaska) | | Total | |
|---|---|---|---|---|---|---|
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| Shad | | | 10,845 | $29,950 | 10,845 | $29,950 |
| Shad roe | | | 3,015 | 95,909 | 3,015 | 95,909 |
| Cat and dog food | 230,010 | $347,171 | 183,424 | 541,228 | 413,434 | 888,399 |
| Fish flakes [22] | 45,721 | 291,426 | | | 45,721 | 291,426 |
| Fish cakes, balls, etc | 97,263 | 665,307 | | | 97,263 | 665,307 |
| Fish paste | 3,987 | 143,147 | | | 3,987 | 143.147 |
| Finnan haddie | 488 | 7,518 | | | 488 | 7,518 |
| Sturgeon caviar | 2,491 | 307,298 | | | 2,491 | 307,298 |
| Whitefish roe and caviar | 1,052 | 36,478 | | | 1,052 | 36,478 |
| Salmon roe and caviar (for food) | 1,563 | 28,077 | | | 1,563 | 28,077 |
| Salmon eggs (for bait) | | | 4,656 | 85,348 | 4,656 | 85,348 |
| Miscellaneous fish and roe [23] | 17,520 | 159,601 | 2,272 | 23,128 | 19,792 | 182,729 |
| Crabs | ([24]) | ([24]) | [24] 13,699 | [24] 260,134 | 13,699 | 260,134 |
| Turtle products | 7,410 | 80,869 | | | 7,410 | 80,869 |
| Miscellaneous shellfish, etc.[25] | 15,765 | 103,445 | 10,818 | 67,041 | 26,583 | 170,486 |
| Total | 423,270 | 2,170,337 | 228,729 | 1,102,738 | 651,999 | 3,273,075 |

[21] Includes the production of whitefish caviar by one firm in Wisconsin.

[22] Tuna flakes are not included in this table, but are included in the table for canned tuna and tunalike fishes.

[23] Includes fish chowder, salted cod, haddock chowder, pickled eels, fish bouillon, kippered sturgeon, rat poison bait, swordfish, deep sea roe, and tuna roe.

[24] The production of hard crabs by one firm in Virginia and one firm in South Carolina is included with the production for the Pacific coast.

[25] Includes terrapin products, oyster soup, pickled mussels, shrimp soup, frog and frogs' legs, crab and shrimp gumbo, crayfish, squid, shellfish newburg, and smoked oysters.

NOTE.—"Standard cases" represents the various sized cases converted to the equivalent of forty-eight 1-pound cans to the case. Shad were canned at 8 plants; shad roe, at 10 plants; cat and dog food, at 9 plants; fish flakes, at 4 plants; fish cakes, balls, etc., at 6 plants; fish paste, at 3 plants; finnan haddie at 3 plants; sturgeon caviar, at 4 plants; whitefish roe and caviar, at 5 plants; salmon roe and caviar (for food), at 4 plants; salmon eggs (for bait), at 8 plants; miscellaneous fish and roe, at 14 plants; crabs, at 21 plants; turtle products, at 4 plants; and miscellaneous shellfish, etc., at 14 plants.

*Canned fishery products and byproducts of the United States and Alaska, 1938*—Con.

### PRODUCTION OF OYSTER AND MARINE CLAM-SHELL PRODUCTS [26]

| State | Crushed shell for poultry feed | | Shell lime | | Total | |
|---|---|---|---|---|---|---|
| | *Tons* | *Value* | *Tons* | *Value* | *Tons* | *Value* |
| Rhode Island, New York, and Delaware | 1,530 | $12,662 | 433 | $1,943 | 1,963 | $14,605 |
| New Jersey | 4,514 | 35,228 | 1,480 | 6,567 | 5,994 | 41,795 |
| Pennsylvania | 3,606 | 33,748 | 627 | 2,744 | 4,233 | 36,492 |
| Maryland | 32,200 | 145,800 | 19,970 | 35,800 | 52,170 | 181,600 |
| Virginia | 21,569 | 123,071 | [27] 32,012 | [27] 184,665 | 53,581 | 307,736 |
| North Carolina, South Carolina, and Florida | 33,565 | 159,921 | 1,375 | 4,250 | 34,940 | 164,171 |
| Alabama, Louisiana, and Texas | 126,431 | 392,852 | 9,431 | 32,416 | 135,862 | 425,268 |
| Mississippi | 17,584 | 64,335 | 5,338 | 4,863 | 22,922 | 69,198 |
| Washington and Oregon | 8,755 | 78,183 | 5,029 | 31,643 | 13,784 | 109,826 |
| California | 11,696 | 53,433 | 2,280 | 12,433 | 13,976 | 65,866 |
| Total | 261,450 | 1,099,233 | 77,975 | 317,324 | 339,425 | 1,416,557 |

[26] The production in Washington includes both clam and oyster-shell products.

[27] Of this amount 14,789 tons valued at $93,338 were reported as burned lime.

NOTE.—The above crushed shell products were prepared at 2 plants in Rhode Island, 1 in New York, 7 in New Jersey, 4 in Pennsylvania, 1 in Delaware, 3 in Maryland, 9 in Virginia, 4 in North Carolina, 1 in South Carolina, 1 in Florida, 1 in Alabama, 3 in Mississippi, 1 in Louisiana, 2 in Texas, 9 in Washington, 1 in Oregon, and 4 in California.

### PRODUCTION OF FRESH-WATER MUSSEL-SHELL PRODUCTS

| Item | Iowa, Missouri, Wisconsin, Illinois, Massachusetts | | New York | | Total | |
|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Pearl buttons gross | 8,376,261 | $2,189,481 | 1,646,191 | $450,023 | 10,022,452 | $2,639,504 |
| Crushed shell for poultry feed tons | [28] 4,446 | [28] 25,845 | (28) | (28) | 4,446 | 25,845 |
| Lime do | [28] 1,111 | [28] 1,140 | (28) | (28) | 1,111 | 1,140 |
| Other products [29] | | 32,390 | | | | 32,390 |
| Total | | 2,248,856 | | 450,023 | | 2,698,879 |

[28] A small production in New York has been combined with that in Iowa.

[29] Consists of mussel-shell chips and novelties produced in Iowa; and novelties produced in Massachusetts.

NOTE.—Mussel shells purchased during the year amounted to 18,522,000 pounds, valued at $219,196. Shells were taken in 15 States in the Mississippi River Valley and Great Lakes region. The producing States in the order of their importance were: Tennessee, which contributed 24 percent of the total quantity, Arkansas, 18 percent; Illinois, 16 percent; Indiana, 14 percent; Kentucky, 10 percent; Iowa, 5 percent; Texas, 3 percent; Alabama, Michigan, and Wisconsin, each 2 percent; Missouri, Ohio, Minnesota, and Oklahoma, each 1 percent; and Louisiana, less than 1 percent.

### PRODUCTION OF MARINE PEARL-SHELL PRODUCTS [30]

| Item | Massachusetts, Rhode Island, and Connecticut | | New York | | New Jersey | |
|---|---|---|---|---|---|---|
| | *Gross* | *Value* | *Gross* | *Value* | *Gross* | *Value* |
| Pearl buttons | [31] 1,540,363 | [31] $919,609 | 1,254,224 | $688,604 | 1,495,932 | $1,153,457 |
| Novelties [33] | | 149,389 | | 76,200 | | 78,604 |
| Total | | 1,068,998 | | 764,804 | | 1,232,061 |

| Item | Maine, Pennsylvania, Maryland, Florida, California | | Total | |
|---|---|---|---|---|
| | *Gross* | *Value* | *Gross* | *Value* |
| Pearl buttons [31] | [32] 1,937,820 | [32] $881,223 | 6,228,339 | $3,642,893 |
| Novelties [33] | | 250,417 | | 554,610 |
| Total | | 1,131,640 | | 4,197,503 |

[30] Produced principally from imported shells.

[31] Pearl buttons manufactured in Connecticut.

[32] Pearl buttons manufactured in Maine, Pennsylvania, and Maryland.

[33] Includes knife handles, handles for manicure sets, dolls, lamps, mounted fish decoys, etc.

NOTE.—Marine pearl-shell products were manufactured at 1 plant in Maine, 2 in Massachusetts, 1 in Rhode Island, 6 in Connecticut, 9 in New York, 20 in New Jersey, 1 in Pennsylvania, 1 in Maryland, 12 in Florida, and 2 in California.

*Canned fishery products and byproducts of the United States and Alaska, 1938*—Con.

### FISH UTILIZED AND PRODUCTS OF THE MENHADEN INDUSTRY

| State | Menahden utilized | Products | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Dry scrap and meal | | Acidulated scrap | | Oil | | Total |
| | *Number* | *Tons* | *Value* | *Tons* | *Value* | *Gallons* | *Value* | *Value* |
| New York, New Jersey, Delaware, and Georgia | 188,507,000 | 6,652 | $280,943 | 9,674 | $191,031 | 1,569,228 | $447,221 | $919,195 |
| Virginia | 144,167,000 | 10,681 | 401,468 | (34) | (34) | 1,087,503 | 319,065 | 720,533 |
| North Carloina | 271,322,000 | 14,338 | 594,252 | 7,176 | 133,481 | 1,301,042 | 346,638 | 1,074,371 |
| Florida | 168,437,000 | 7,603 | 299,957 | 4,964 | 94,424 | 231,356 | 60,743 | 455,124 |
| Total | [35] 772,433,000 | [36] 39,274 | [36] 1,576,620 | 21,814 | 418,936 | 4,189,129 | 1,173,667 | 3,169,223 |

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[34] The production of acidulated scrap by 1 firm in Virginia has been included with the New York, New Jersey, Delaware, and Georgia production.

[35] 466,330,800 pounds.

[36] Of this production, 26,096 tons, valued at $1,006,428 were reported as dry scrap and 13,178 tons, valued at $570,192, as meal.

NOTE.—The menhaden factories were located as follows: 1 in New York, 3 in New Jersey, 2 in Delaware 10 in Virginia, 10 in North Carolina, 1 in Georgia, and 5 in Florida.

### PRODUCTION OF MISCELLANEOUS BYPRODUCTS

| Product | Atlantic and Gulf coasts [37] | | Pacific coast (including Alaska) | | Total | |
|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Dried scrap: | | | | | | |
| Blue crab……tons | 1,515 | $25,135 | ---------- | ---------- | 1,515 | $25,135 |
| King crab……do | 255 | 9,689 | ---------- | ---------- | 255 | 9,689 |
| Miscellaneous [38]……do | 1,435 | 38,101 | ---------- | ---------- | 1,435 | 38,101 |
| Meal: | | | | | | |
| Groundfish "white fish"……do | 7,725 | 364,250 | ---------- | ---------- | 7,725 | 364,250 |
| Herring……do | 1,652 | 42,974 | 16,095 | $549,614 | 17,747 | 592,588 |
| Mackerel……do | ---------- | ---------- | 1,574 | 58,580 | 1,574 | 58,580 |
| Pilchard……do | ---------- | ---------- | 89,927 | 3,437,892 | 89,927 | 3,437,892 |
| Salmon……do | ---------- | ---------- | 1,846 | 61,807 | 1,846 | 61,807 |
| Tuna……do | ---------- | ---------- | 9,650 | 350,631 | 9,650 | 350,631 |
| King crab……do | 123 | 4,215 | ---------- | ---------- | 123 | 4,215 |
| Shrimp……do | 1,426 | 29,763 | 170 | 3,400 | 1,596 | 33,163 |
| Whale (meat)……do | ---------- | ---------- | 396 | 15,796 | 396 | 15,796 |
| Whale (bone)……do | ---------- | ---------- | 216 | 5,618 | 216 | 5,618 |
| Miscellaneous [39]……do | 7,821 | 336,313 | 2,302 | 88,829 | 10,123 | 425,142 |
| Oil: | | | | | | |
| Alewife……gallons | 18,681 | 3,277 | ---------- | ---------- | 18,681 | 3,277 |
| Cod……do | 4,604 | 1,308 | ---------- | ---------- | 4,604 | 1,308 |
| Cod-liver……do | 261,556 | 164,986 | ---------- | ---------- | 261,556 | 164,986 |
| Fur-seal……do | ---------- | ---------- | 29,865 | 4,157 | 29,865 | 4,157 |
| Herring……do | 56,452 | 6,132 | 4,523,113 | 1,292,705 | 4,579,565 | 1,298,837 |
| Mackerel……do | ---------- | ---------- | 86,364 | 25,878 | 86,364 | 25,878 |
| Pilchard……do | ---------- | ---------- | 17,539,567 | 5,205,337 | 17,539,567 | 5,205,337 |
| Salmon [40]……do | ---------- | ---------- | 165,825 | 68,593 | 165,825 | 68,593 |
| Shark liver……do | (41) | (41) | [41] 129,705 | [41] 330,397 | 129,705 | 330,397 |
| Tuna……do | ---------- | ---------- | 192,515 | 55,654 | 192,515 | 55,654 |
| Whale: | | | | | | |
| Sperm……do | ---------- | ---------- | 181,900 | 54,570 | 181,900 | 54,570 |
| Other……do | 7,254,300 | 3,025,831 | 304,800 | 103,657 | 7,559,100 | 3,129,488 |
| Liver, miscellaneous [42]……do | 15,836 | 648,426 | 99,106 | 1,332,534 | 114,942 | 1,980,960 |
| Miscellaneous [43]……do | 74,322 | 25,541 | 12,495 | 3,365 | 86,817 | 28,906 |
| Shark fins……pounds | 41,870 | 17,248 | ---------- | ---------- | 41,870 | 17,248 |
| Shark skins……do | 147,520 | 17,555 | ---------- | ---------- | 147,520 | 17,555 |
| Liquid glue [44]……gallons | 383,769 | 805,804 | (44) | (44) | 383,769 | 805,804 |
| Miscellaneous byproducts [45] | ---------- | 145,363 | ---------- | 333,280 | ---------- | 478,643 |
| Total | ---------- | 5,711,911 | ---------- | 13,382,294 | ---------- | 19,094,205 |

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[37] Includes the production of burbot-liver oil in Minnesota and Wisconsin.

[38] Includes alewife, herring, shark, and miscellaneous dry and green scrap.

[39] Includes alewife, rosefish, salmon egg, shark, starfish, clam, and miscellaneous meals.

[40] Includes a considerable quantity of salmon oil especially prepared for human consumption.

[41] The production of shark-liver oil in Massachusetts and Florida has been included with the production in the Pacific Coast States.

[42] Includes burbot, halibut, sablefish, swordfish, tuna, and miscellaneous liver oils. A small quantity of halibut viscera oil has been included with the Pacific coast production of miscellaneous liver oils.

[43] Includes rosefish, shark, and miscellaneous fish oils.

[44] A quantity of liquid glue produced by one firm in California is included with the production of liquid glue on the Atlantic and Gulf coasts.

[45] Includes isinglass, kelp products, pearl essence, and herring pomace.

NOTE.—The whale products shown for the Atlantic and Gulf Coasts were produced on factory ships operating in the Southern Hemisphere.

# FROZEN FISH TRADE [5]

## FISH FROZEN

During 1938 the output of freezing plants which reported their activities to the Government amounted to 186,096,050 pounds of fishery products. At the time these products were held in cold-storage plants they were estimated to be valued at about $13,000,000. Compared with the output in 1937, this is an increase of 11 percent in volume. Six items accounted for 48 percent of the total amount frozen. In the order of their importance, they were: Haddock fillets, which accounted for 11 percent of the total; rosefish fillets and whiting, each 9 percent; halibut, 8 percent; pollock, 6 percent, and mackerel 5 percent. Other products frozen in considerable quantity during the year were cod fillets, silver salmon, and shrimp.

*Production of frozen fishery products, 1938*

BY SPECIES AND MONTHS

| Species | Month ending the 15th of— | | | | | |
|---|---|---|---|---|---|---|
| | January | February | March | April | May | June |
| FROZEN FISH | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Bluefish (all trade sizes) | 385, 429 | 67, 684 | 9, 043 | 15, 161 | 35, 999 | 2, 317 |
| Butterfish (all trade sizes) | 15, 542 | 4, 966 | 26, 821 | 29, 856 | 128, 587 | 208, 142 |
| Catfish | 34, 023 | 42, 217 | 57, 327 | 78, 540 | 143, 302 | 63, 752 |
| Cisco (Lake Erie) | 14, 284 | 6, 841 | 21, 466 | 11, 500 | 3, 603 | 2, 759 |
| Cisco (lake herring), including bluefin, blackfin, and chub | 204, 282 | 39, 057 | 23, 656 | 15, 779 | 57, 184 | 38, 313 |
| Cisco (tullibee, Canadian lakes) | 280 | ---------- | 6, 635 | 422 | ---------- | ---------- |
| Cod, haddock, hake, and pollock (except fillets of cod, haddock, and pollock) | 209, 187 | 98, 613 | 134, 468 | 156, 877 | 203, 436 | 318, 898 |
| Cod fillets | 264, 137 | 221, 293 | 146, 107 | 723, 926 | 1, 195, 099 | 739, 495 |
| Croaker | 9, 612 | 1, 076 | 16, 608 | 625, 654 | 660, 250 | 430, 731 |
| Flounders | 59, 957 | 21, 085 | 15, 037 | 19, 207 | 116, 891 | 132, 124 |
| Haddock fillets | 672, 395 | 834, 322 | 905, 508 | 2, 760, 280 | 2, 634, 938 | 1, 130, 178 |
| Halibut (all trade sizes) | ---------- | ---------- | 1, 589 | 173, 647 | 2, 589, 995 | 3, 225, 938 |
| Herring, sea (including alewives and bluebacks) | 102, 521 | 45, 209 | 379, 970 | 231, 103 | 1, 329, 698 | 1, 041, 093 |
| Lake trout | 26, 451 | 12, 123 | 59, 720 | 28, 411 | 71, 352 | 33, 857 |
| Mackerel (except Spanish) | 115, 573 | 63, 338 | 36, 785 | 206, 444 | 2, 327, 078 | 1, 471, 370 |
| Perch, yellow | 18, 047 | 3, 065 | 4, 716 | 5, 721 | 10, 320 | 7, 147 |
| Pike, blue and sauger | 5, 307 | 34, 092 | 4, 809 | 230 | 248, 871 | 4, 628 |
| Pike, yellow or wall-eyed | 8, 377 | 4, 188 | 12, 942 | 6, 698 | 21, 950 | 2, 636 |
| Pike (including pickerel, jacks, and yellow jack) | 2, 499 | 1, 428 | 58, 578 | 5, 109 | 9, 632 | 1, 349 |
| Pollock fillets | 1, 369, 512 | 703, 239 | 67, 900 | 324, 110 | 862, 828 | 694, 509 |
| Rosefish fillets | 1, 968, 948 | 705, 102 | 550, 855 | 612, 321 | 1, 121, 985 | 2, 576, 744 |
| Sablefish (black cod) | 80, 346 | 44, 742 | 337, 276 | 50, 847 | 14, 034 | 41, 724 |
| Salmon, king or chinook | 12, 412 | 46, 066 | 5, 983 | 46, 792 | 34, 355 | 341, 085 |
| Salmon, silver or coho | 15, 835 | 23, 570 | 13, 266 | 68, 234 | 17, 365 | 16, 818 |
| Salmon, fall and pink | 17, 099 | 17, 568 | 209, 714 | 74, 942 | 42, 127 | 15, 911 |
| Salmon, steelhead trout | 15, 659 | 4, 256 | 16, 751 | 27, 732 | 18, 409 | 27, 095 |
| Scup (porgies) | 1, 623 | 10, 379 | 1, 000 | 900 | 61, 168 | 63, 181 |
| Shad and shad roe | 9, 694 | 6, 759 | 9, 731 | 5, 307 | 297, 999 | 59, 432 |
| Smelts, eulachon, etc | 101, 212 | 229, 964 | 73, 496 | 116, 806 | 230, 539 | 60, 192 |
| Sturgeon and spoonbill cat | 9, 635 | 850 | 51, 701 | 35, 588 | 49, 300 | 36, 641 |
| Suckers | 460 | 60, 000 | 1, 214 | 672 | 4, 671 | 14, 080 |
| Swordfish | 434, 527 | 190, 023 | 50, 446 | 92, 710 | 109, 152 | 25, 966 |
| Weakfish (including southern "sea trout") | 70, 484 | 225 | 3, 868 | 4, 307 | 85, 163 | 40, 599 |
| Whitefish | 145, 531 | 176, 350 | 153, 698 | 123, 635 | 85, 543 | 48. 025 |
| Whiting | 630, 627 | 47, 366 | 121, 911 | 185, 059 | 325, 699 | 2, 512, 798 |
| Other fish | 1, 465, 640 | 1, 072, 777 | 928, 644 | 1, 545, 199 | 1, 657, 228 | 1, 810, 586 |
| Total fish | 8, 497, 147 | 4, 839, 833 | 4, 519, 239 | 8, 409, 726 | 16, 805, 750 | 17, 240, 113 |
| FROZEN SHELLFISH | | | | | | |
| Scallops | (1) | (1) | (1) | (1) | (1) | (1) |
| Shrimp | (1) | (1) | (1) | (1) | (1) | (1) |
| Spiny lobster tails | (1) | (1) | (1) | (1) | (1) | (1) |
| Squid | 25, 783 | 7, 671 | 46, 398 | 32, 384 | 438, 524 | 631, 730 |
| Other shellfish | 683, 674 | 921, 712 | 653, 127 | 640, 292 | 1, 004, 010 | 1, 505, 291 |
| Total shellfish | 709, 457 | 929, 383 | 699, 525 | 672, 676 | 1, 442, 534 | 2, 137, 021 |
| Total fish and shellfish | 9, 206, 604 | 5. 769, 216 | 5, 218, 764 | 9, 082, 402 | 18, 248, 284 | 19, 377, 134 |

(1) Included with "Other shellfish."

[5] The statistics in this section have been furnished by the Bureau of Agricultural Economics, Department of Agriculture.

## *Production of frozen fishery products, 1938*—Continued

### BY SPECIES AND MONTHS—Continued

| Species | Month ending the 15th of— | | | | | | |
|---|---|---|---|---|---|---|---|
| | July | August | September | October | November | December | Total |
| FROZEN FISH | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Bluefish (all trade sizes) | 15, 547 | 11, 099 | 17, 238 | 189, 155 | 159, 064 | 84, 932 | 992, 668 |
| Butterfish (all trade sizes) | 73, 929 | 220, 652 | 30, 171 | 163, 669 | 247, 538 | 32, 071 | 1, 181, 944 |
| Catfish | 30, 346 | 64, 079 | 25, 567 | 40, 090 | 39, 145 | 58, 442 | 676, 830 |
| Cisco (Lake Erie) | 6, 416 | 42, 679 | 137, 682 | 101, 404 | 81, 308 | 267, 623 | 697, 565 |
| Cisco (lake herring), including bluefin, blackfin, and chub | 253, 973 | 283, 119 | 236, 090 | 294, 902 | 845, 942 | 1, 309, 469 | 3, 601, 766 |
| Cisco (tullibee, Canadian lakes) | 4, 580 | 36, 277 | 136, 183 | 880 | 23, 965 | 19, 082 | 228, 304 |
| Cod, haddock, hake, and pollock (except fillets of cod, haddock, and pollock) | 233, 740 | 227, 712 | 290, 028 | 184, 850 | 315, 580 | 289, 622 | 2, 663, 011 |
| Cod fillets | 806, 561 | 667, 516 | 418, 246 | 454, 623 | 784, 342 | 715, 453 | 7, 136, 798 |
| Croaker | 221, 981 | 437. 743 | 230, 862 | 43, 240 | 31, 074 | 4, 016 | 2, 712, 847 |
| Flounders | 92, 954 | 54, 762 | 55, 471 | 46, 741 | 235, 835 | 18, 159 | 868, 223 |
| Haddock fillets | 1, 818, 857 | 2, 744, 825 | 3, 673, 869 | 1, 350, 695 | 1, 045, 967 | 522, 507 | 20, 094, 341 |
| Halibut (all trade sizes) | 3, 135, 702 | 3, 681, 266 | 824, 971 | 937, 599 | 791, 700 | ---------- | 15, 362, 407 |
| Herring, sea (including alewives and bluebacks) | 176, 168 | 88, 361 | 87, 861 | 437, 228 | 624, 051 | 429, 484 | 4, 972, 747 |
| Lake trout | 52, 091 | 45, 926 | 55, 067 | 159, 740 | 366, 497 | 255, 323 | 1, 166, 558 |
| Mackerel (except Spanish) | 1, 672, 951 | 1, 159, 748 | 319, 304 | 68, 054 | 976, 342 | 456, 236 | 8, 873, 223 |
| Perch, yellow | 3, 663 | 51, 377 | 84, 864 | 68, 553 | 166, 608 | 110, 467 | 534, 548 |
| Pike, blue and sauger | 6, 880 | 1, 951 | 285 | 226, 794 | 235, 263 | 108, 480 | 877, 590 |
| Pike, yellow or wall-eyed | 2, 893 | 7, 062 | 16, 007 | 21, 812 | 29, 901 | 4, 853 | 139, 319 |
| Pike (including pickerel, jacks, and yellow jack) | 3, 189 | 11, 343 | 7, 431 | 6, 219 | 45, 709 | 23, 038 | 175, 524 |
| Pollock fillets | 702, 200 | 457, 129 | 456, 815 | 679, 600 | 2, 392, 322 | 3, 285, 694 | 11, 995, 858 |
| Rosefish fillets | 1, 708, 735 | 1, 658, 905 | 2, 117, 335 | 1, 343, 312 | 1, 434, 999 | 864, 778 | 16, 664, 019 |
| Sablefish (black cod) | 216, 035 | 333, 856 | 650, 432 | 947, 501 | 728, 553 | 337, 451 | 3, 782, 797 |
| Salmon, king or chinook | 546, 476 | 436, 593 | 930, 321 | 1, 579, 563 | 591, 908 | 48, 640 | 4, 620, 194 |
| Salmon, silver or coho | 128, 153 | 1, 938, 071 | 2, 980, 974 | 1, 466, 482 | 761, 740 | 73, 984 | 7, 504, 492 |
| Salmon, fall and pink | 45, 252 | 298, 620 | 388, 076 | 631, 593 | 3, 251, 337 | 514, 900 | 5, 507, 139 |
| Salmon, steelhead trout | 112, 556 | 217, 270 | 149, 163 | 145, 637 | 37, 915 | 46, 403 | 818, 846 |
| Scup (porgies) | 124, 794 | 75, 851 | 26, 382 | 17, 988 | 4, 963 | 1, 974 | 390, 203 |
| Shad and shad roe | 105, 581 | 15, 069 | 701 | 82, 200 | 58, 926 | 20, 834 | 672, 233 |
| Smelts, eulachon, etc | 23, 588 | 53, 871 | 35, 670 | 29, 980 | 58, 343 | 70, 372 | 1, 084, 033 |
| Sturgeon and spoonbill cat | 40, 646 | 20, 575 | 44, 198 | 75, 246 | 121, 503 | 32, 722 | 518, 605 |
| Suckers | 12, 788 | 10, 475 | ---------- | 105 | 2, 063 | 1, 529 | 108, 057 |
| Swordfish | 53, 489 | 163, 607 | 189, 822 | 96, 576 | 88, 878 | 280, 577 | 1, 775, 773 |
| Weakfish (including southern "sea trout") | 145, 546 | 234, 097 | 136, 513 | 13, 418 | 43, 336 | 45, 904 | 823, 460 |
| Whitefish | 70, 111 | 85, 484 | 49, 421 | 78, 515 | 186, 598 | 276, 617 | 1, 479, 528 |
| Whiting | 6, 279, 138 | 2, 886, 016 | 2, 805, 674 | 597, 073 | 607, 099 | 563, 243 | 17, 561, 703 |
| Other fish | 1, 752, 157 | 1, 469, 260 | 1, 749. 429 | 2, 522, 044 | 2, 020, 673 | 2, 211, 653 | 20, 205, 290 |
| Total fish | 20, 679, 666 | 20, 192, 246 | 19, 358, 123 | 15, 103, 081 | 19, 436, 987 | 13, 386, 532 | 168, 468, 443 |
| FROZEN SHELLFISH | | | | | | | |
| Scallops | 448, 154 | 202, 945 | 584, 291 | 226, 035 | 291, 651 | 256, 868 | 2, 009, 944 |
| Shrimp | 558, 760 | 180, 944 | 226, 143 | 1, 038, 638 | 2, 403, 567 | 1, 627, 356 | 6, 035, 408 |
| Spiny lobster tails | 80, 337 | 16, 060 | 42, 189 | 68, 429 | 27, 976 | 45, 949 | 280, 940 |
| Squid | 395, 151 | 184, 869 | 160, 256 | 18, 683 | 149, 032 | 175, 936 | 2, 266, 417 |
| Other shellfish | 267, 708 | 119, 065 | 253. 452 | 516, 518 | 227, 195 | 212, 854 | 7, 034, 898 |
| Total shellfish | 1, 750, 110 | 703, 883 | 1, 266, 331 | 1, 898, 303 | 3, 099, 421 | 2, 318, 963 | 17, 627, 607 |
| Total fish and shellfish | 22, 429, 776 | 20, 896, 129 | 20, 624, 454 | 17, 001, 384 | 22, 536, 408 | 15, 705. 495 | 186, 096, 050 |

*Production of frozen fishery products, 1938*—Continued

BY GEOGRAPHICAL SECTIONS AND SPECIES [1]

[Expressed in thousands of pounds; that is, 000 omitted]

| Species | New England | Middle Atlantic | South Atlantic | North Central, East | North Central, West | South Central | Pacific | Total |
|---|---|---|---|---|---|---|---|---|
| FROZEN FISH | | | | | | | | |
| Bluefish (all trade sizes) | 25 | 879 | 42 | 45 | 1 | 1 | -------- | 993 |
| Butterfish (all trade sizes) | 91 | 1, 077 | 10 | 1 | -------- | 3 | -------- | 1, 182 |
| Catfish | 166 | 1 | 59 | 62 | 163 | 221 | 5 | 677 |
| Cisco (Lake Erie) | -------- | 663 | -------- | 35 | -------- | -------- | -------- | 698 |
| Cisco (lake herring) including bluefin, blackfin, and chub | 17 | 737 | -------- | 2, 108 | 739 | -------- | -------- | 3, 601 |
| Cisco (tullibee, Canadian lakes) | 9 | 24 | -------- | 11 | 184 | -------- | -------- | 228 |
| Cod, haddock, hake, and pollock (except fillets of cod, haddock, and pollock) | 1, 268 | 109 | 4 | 129 | 56 | 510 | 587 | 2, 663 |
| Cod fillets | 6, 954 | 6 | -------- | 101 | 46 | -------- | 30 | 7, 137 |
| Croaker | -------- | 357 | 2, 321 | 35 | -------- | -------- | -------- | 2, 713 |
| Flounders | 186 | 508 | 2 | 20 | 1 | 2 | 149 | 868 |
| Haddock fillets | 19, 394 | 154 | 22 | 286 | 68 | -------- | 170 | 20, 094 |
| Halibut (all trade sizes) | 194 | 265 | 29 | 265 | 58 | 4 | 14, 547 | 15, 362 |
| Herring, sea (including alewives and bluebacks) | 2, 896 | 621 | 15 | 192 | 14 | 1 | 1, 234 | 4, 973 |
| Lake trout | 24 | 335 | 26 | 713 | 52 | 11 | 6 | 1, 167 |
| Mackerel (except Spanish) | 6, 348 | 2, 073 | 82 | 210 | 6 | -------- | 154 | 8, 873 |
| Perch, yellow | 5 | 11 | 6 | 419 | 91 | -------- | 3 | 535 |
| Pike, blue and sauger | -------- | 243 | -------- | 634 | -------- | -------- | 1 | 878 |
| Pike, yellow or wall-eyed | -------- | 63 | -------- | 59 | 17 | -------- | -------- | 139 |
| Pike (including pickerel, jacks, and yellow jack) | -------- | 12 | -------- | 54 | 110 | -------- | -------- | 176 |
| Pollock fillets | 11, 740 | -------- | -------- | 251 | 5 | -------- | -------- | 11, 996 |
| Rosefish fillets | 16, 555 | -------- | -------- | 109 | -------- | -------- | -------- | 16, 664 |
| Sablefish (black cod) | -------- | 457 | -------- | -------- | 148 | -------- | 3, 178 | 3, 783 |
| Salmon, king or chinook | 81 | 339 | -------- | 9 | 54 | -------- | 4, 137 | 4, 620 |
| Salmon, silver or coho | 36 | 244 | -------- | 19 | 21 | 5 | 7, 178 | 7, 503 |
| Salmon, fall and pink | 3 | 825 | -------- | 83 | 60 | 1 | 4, 535 | 5, 507 |
| Salmon, steelhead trout | -------- | 38 | 13 | -------- | -------- | -------- | 768 | 819 |
| Scup (porgies) | 43 | 347 | -------- | -------- | -------- | -------- | -------- | 390 |
| Shad and shad roe | 33 | 510 | 2 | 10 | 1 | 2 | 114 | 672 |
| Smelts, eulachon, etc | 58 | 470 | 7 | 421 | 1 | -------- | 127 | 1, 084 |
| Sturgeon and spoonbill cat | -------- | 496 | -------- | 4 | 13 | 3 | 3 | 519 |
| Suckers | -------- | -------- | 70 | 38 | -------- | -------- | -------- | 108 |
| Swordfish | 268 | 1, 057 | 15 | 3 | -------- | -------- | 433 | 1, 776 |
| Weakfish (including southern "sea trout") | -------- | 487 | 336 | -------- | -------- | -------- | -------- | 823 |
| Whitefish | 84 | 995 | 57 | 206 | 66 | 2 | 70 | 1, 480 |
| Whiting | 15, 368 | 1, 222 | 67 | 152 | 214 | 522 | 17 | 17, 562 |
| Other fish | 2, 532 | 2, 480 | 3, 839 | 2, 256 | 736 | 3, 220 | 5, 142 | 20, 205 |
| Total fish | 84, 378 | 18, 105 | 7, 024 | 8, 940 | 2, 925 | 4, 508 | 42, 588 | 168, 468 |
| FROZEN SHELLFISH | | | | | | | | |
| Scallops [2] | 920 | 739 | 16 | 26 | 13 | 3 | 293 | 2, 010 |
| Shrimp [2] | 275 | 1, 168 | 595 | 943 | 738 | 1, 405 | 911 | 6, 035 |
| Spiny lobster tails [2] | -------- | 183 | 8 | 18 | -------- | -------- | 72 | 281 |
| Squid | 1, 139 | 756 | 1 | 5 | -------- | -------- | 366 | 2, 267 |
| Other shellfish | 385 | 2, 001 | 113 | 593 | 160 | 1, 494 | 2, 289 | 7, 035 |
| Total shellfish | 2, 719 | 4, 847 | 733 | 1, 585 | 911 | 2, 902 | 3, 931 | 17, 628 |
| Total fish and shellfish | 87, 097 | 22, 952 | 7, 757 | 10, 525 | 3, 836 | 7, 410 | 46, 519 | 186, 096 |

[1] New England includes the 6 States of that section; Middle Atlantic—New York, New Jersey, and Pennsylvania; South Atlantic—Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida; North Central, East—Ohio, Indiana, Illinois, Michigan, and Wisconsin; North Central, West—Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas; South Central—Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Oklahoma, and Arkansas; and Pacific—Washington, Oregon, California, and Alaska.

[2] Prior to July 15, 1938, this item was included with "Other shellfish."

*Production of frozen fishery products, 1938*—Continued

BY GEOGRAPHICAL SECTIONS AND MONTHS [1]

[Expressed in thousands of pounds; that is, 000 omitted]

| Month ended the 15th of— | New England | Middle Atlantic | South Atlantic | North Central, East | North Central, West | South Central | Pacific | Total |
|---|---|---|---|---|---|---|---|---|
| January | 5,096 | 2,328 | 314 | 357 | 178 | 235 | 699 | 9,207 |
| February | 2,794 | 1,248 | 388 | 135 | 137 | 363 | 704 | 5,769 |
| March | 1,995 | 1,078 | 59 | 169 | 380 | 464 | 1,074 | 5,219 |
| April | 4,737 | 863 | 1,280 | 566 | 113 | 570 | 953 | 9,082 |
| May | 8,446 | 3,417 | 1,310 | 853 | 147 | 588 | 3,487 | 18,248 |
| June | 10,855 | 1,582 | 1,139 | 750 | 119 | 776 | 4,156 | 19,377 |
| July | 13,495 | 1,272 | 676 | 591 | 371 | 638 | 5,387 | 22,430 |
| August | 10,280 | 1,125 | 666 | 674 | 222 | 401 | 7,528 | 20,896 |
| September | 10,514 | 1,858 | 271 | 604 | 215 | 523 | 6,639 | 20,624 |
| October | 4,912 | 2,559 | 279 | 1,309 | 195 | 839 | 6,909 | 17,002 |
| November | 7,727 | 2,909 | 679 | 2,377 | 638 | 1,162 | 7,044 | 22,536 |
| December | 6,246 | 2,713 | 696 | 2,140 | 1,121 | 851 | 1,939 | 15,706 |
| Total | 87,097 | 22,952 | 7,757 | 10,525 | 3,836 | 7,410 | 46,519 | 186,096 |

[1] New England includes the 6 States of that section; Middle Atlantic—New York, New Jersey, and Pennsylvania; South Atlantic—Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida; North Central, East—Ohio, Indiana, Illinois, Michigan, and Wisconsin; North Central, West—Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska and Kansas; South Central—Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Oklahoma, and Arkansas; and Pacific—Washington, Oregon, California, and Alaska.

## HOLDINGS

During 1938, monthly holdings of frozen fish and shellfish averaged 67,994,000 pounds, which is an increase of 7 percent as compared with 1937. The holdings during January, amounting to 93,024,000 pounds, were the largest for any month during the year; while those for April, amounting to 37,367,000 pounds were the smallest. During the last 4 months of the year an average of 88,484,000 pounds of fishery products were in storage, as compared with an average of 74,916,000 pounds for the same period in 1937.

### *Holdings of frozen fishery products, 1938*

BY SPECIES AND MONTHS

| Species | Month ended the 15th of— | | | | | |
|---|---|---|---|---|---|---|
| | January | February | March | April | May | June |
| FROZEN FISH | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Bluefish (all trade sizes) | 740, 725 | 690, 305 | 562, 636 | 401, 922 | 387, 309 | 268, 272 |
| Butterfish (all trade sizes) | 535, 091 | 437, 958 | 347, 627 | 277, 282 | 322, 139 | 443, 782 |
| Catfish | 336, 140 | 309, 938 | 213, 801 | 219, 250 | 285, 893 | 268, 388 |
| Cisco (Lake Erie) | 230, 005 | 166, 102 | 134, 159 | 91, 483 | 46, 726 | 55, 986 |
| Cisco (lake herring) including bluefin, blackfin, and chub | 1, 626, 950 | 1, 186, 453 | 841, 963 | 451, 179 | 362, 637 | 300, 492 |
| Cisco (tullibee, Canadian lakes) | 47, 636 | 78, 032 | 90, 136 | 114, 065 | 104, 024 | 91, 730 |
| Cod, haddock, hake, and pollock (except fillets of cod, haddock, and pollock) | 968, 580 | 906, 313 | 847, 468 | 806, 920 | 882, 481 | 1, 070, 593 |
| Cod fillets | 2, 422, 342 | 2, 333, 321 | 1, 863, 635 | 2, 106, 925 | 2, 855, 522 | 2, 954, 622 |
| Croakers | 596, 698 | 336, 219 | 154, 985 | 586, 518 | 1, 252, 152 | 1, 583, 894 |
| Flounders | 546, 387 | 521, 495 | 319, 221 | 330, 849 | 422, 755 | 478, 834 |
| Haddock fillets | 5, 194, 038 | 4, 313, 054 | 3, 008, 324 | 4, 641, 663 | 5, 892, 820 | 5, 428, 550 |
| Halibut (all trade sizes) | 6, 245, 177 | 4, 316, 869 | 2, 589, 022 | 1, 450, 414 | 3, 809, 953 | 6, 817, 386 |
| Herring, sea (including alewives and bluebacks) | 1, 672, 336 | 1, 509, 763 | 1, 224, 493 | 1, 094, 393 | 2, 165, 632 | 2, 899, 247 |
| Lake trout | 458, 817 | 323, 028 | 308, 532 | 174, 177 | 269, 166 | 282, 985 |
| Mackerel (except Spanish) | 2, 956, 591 | 2, 379, 583 | 1, 640, 001 | 1, 048, 032 | 3, 124, 617 | 4, 217, 046 |
| Perch, yellow | 284, 369 | 191, 693 | 115, 511 | 75, 557 | 58, 575 | 70, 676 |
| Pike, blue and sauger | 226, 536 | 376, 424 | 353, 590 | 294, 448 | 526, 196 | 293, 991 |
| Pike, yellow or wall-eyed | 155, 174 | 196, 408 | 161, 813 | 113, 193 | 104, 702 | 69, 960 |
| Pike (including pickerel, jacks, and yellow jack) | 161, 755 | 180, 385 | 217, 526 | 182, 539 | 133, 167 | 104, 940 |
| Pollock fillets | 4, 081, 904 | 3, 731, 436 | 2, 390, 310 | 1, 854, 799 | 2, 040, 138 | 1, 919, 238 |
| Rosefish fillets | 3, 728, 833 | 3, 243, 685 | 2, 548, 638 | 1, 622, 754 | 1, 704, 164 | 2, 704, 632 |
| Sablefish (black cod) | 2, 261, 305 | 1, 733, 037 | 1, 468, 559 | 1, 139, 320 | 854, 086 | 724, 348 |
| Salmon, king or chinook | 2, 688, 014 | 2, 071, 844 | 1, 412, 694 | 940, 687 | 544, 016 | 515, 675 |
| Salmon, silver or cohoe | 3, 060, 582 | 1, 841, 676 | 999, 601 | 599, 654 | 428, 986 | 328, 034 |
| Salmon, fall and pink | 3, 758, 347 | 3, 064, 855 | 2, 376, 797 | 1, 827, 922 | 1, 536, 867 | 1, 245, 321 |
| Salmon, steelhead trout | 271, 411 | 239, 815 | 183, 669 | 143, 057 | 134, 378 | 123, 107 |
| Scup (porgies) | 272, 266 | 207, 169 | 40, 592 | 37, 381 | 93, 903 | 153, 010 |
| Shad and shad roe | 384, 721 | 299, 129 | 206, 336 | 145, 736 | 427, 964 | 474, 664 |
| Smelts, eulachon, etc | 591, 215 | 1, 473, 769 | 1, 337, 364 | 852, 468 | 813, 926 | 829, 359 |
| Sturgeon and spoonbill cat | (1) | 819, 254 | 661, 978 | 481, 582 | 458, 171 | 268, 374 |
| Suckers | 101, 333 | 102, 043 | 90, 962 | 88, 206 | 46, 295 | 54, 595 |
| Swordfish | 1, 947, 437 | 1, 848, 702 | 1, 443, 769 | 1, 145, 514 | 1, 136, 258 | 871, 257 |
| Weakfish (including southern "sea trout") | 1, 208, 940 | 870, 068 | 614, 029 | 409, 430 | 455, 936 | 466, 659 |
| Whitefish | 1, 224, 257 | 1, 677, 872 | 1, 634, 692 | 1, 609, 572 | 1, 403, 088 | 1, 255, 072 |
| Whiting | 6, 621, 738 | 4, 391, 662 | 2, 280, 587 | 1, 126, 622 | 799, 404 | 2, 451, 273 |
| Other fish | 7, 973, 998 | 6, 908, 037 | 5, 685, 631 | 5, 266, 090 | 6, 020, 037 | 7, 217, 294 |
| Total fish | 65, 581, 648 | 55, 280, 396 | 40, 370, 651 | 33, 751, 603 | 41, 904, 083 | 49, 333, 286 |
| FROZEN SHELLFISH | | | | | | |
| Scallops | (2) | (2) | (2) | (2) | (2) | (2) |
| Shrimp | (2) | (2) | (2) | (2) | (2) | (2) |
| Spiny lobster tails | (2) | (2) | (2) | (2) | (2) | (2) |
| Squid | 1, 736, 262 | 1, 510, 746 | 1, 080, 691 | 601, 100 | 881, 745 | 1, 445, 763 |
| Other shellfish | 5, 809, 661 | 5, 392, 658 | 4, 242, 581 | 3, 014, 620 | 3, 195, 304 | 4, 259, 842 |
| Total shellfish | 7, 545, 923 | 6, 903, 404 | 5, 323, 272 | 3, 615, 720 | 4, 077, 049 | 5, 705, 605 |
| Total fish and shellfish | 73, 127, 571 | 62, 183, 800 | 45, 693, 923 | 37, 367, 323 | 45, 981, 132 | 55, 038, 891 |

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[1] Included with "other fish."
[2] Included with "Other shellfish."

## *Holdings of frozen fishery products, 1938*—Continued

### BY SPECIES AND MONTHS—Continued

| Species | Month ended the 15th of— | | | | | |
|---|---|---|---|---|---|---|
| | July | August | September | October | November | December |
| FROZEN FISH | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Bluefish (all trade sizes) | 198, 319 | 106, 934 | 93, 083 | 294, 947 | 316, 675 | 252, 017 |
| Butterfish (all trade sizes) | 425, 716 | 614, 866 | 534, 668 | 546, 407 | 736, 105 | 643, 524 |
| Catfish | 241, 991 | 242, 661 | 227, 902 | 234, 173 | 273, 771 | 306, 058 |
| Cisco (Lake Erie) | 52, 118 | 115, 778 | 257, 680 | 511, 619 | 546, 585 | 749, 444 |
| Cisco (lake herring) including bluefin, blackfin, and chub | 547, 780 | 802, 579 | 1, 138, 173 | 1, 057, 335 | 1, 537, 137 | 2, 382, 005 |
| Cisco (tullibee, Canadian lakes) | 81, 307 | 110, 562 | 244, 271 | 193, 440 | 204, 301 | 386, 437 |
| Cod, haddock, hake, and pollock (except fillets of cod, haddock, and pollock) | 1, 200, 476 | 1, 171, 969 | 1, 156, 562 | 1, 116, 432 | 1, 105, 553 | 1, 139, 670 |
| Cod fillets | 3, 303, 794 | 2, 987, 113 | 2, 325, 832 | 1, 624, 134 | 1, 640, 749 | 1, 876, 035 |
| Croakers | 1, 908, 359 | 2, 397, 789 | 2, 196, 057 | 1, 555, 805 | 1, 483, 346 | 1, 097, 902 |
| Flounders | 479, 006 | 455, 594 | 432, 545 | 397, 194 | 624, 091 | 479, 569 |
| Haddock fillets | 5, 737, 354 | 6, 672, 037 | 8, 760, 988 | 8, 365, 928 | 7, 672, 491 | 6, 166, 938 |
| Halibut (all trade sizes) | 9, 737, 752 | 13, 099, 319 | 13, 576, 610 | 13, 326, 114 | 12, 042, 653 | 9, 644, 725 |
| Herring, sea (including alewives and bluebacks) | 2, 602, 211 | 2, 251, 547 | 1, 668, 685 | 1, 709, 863 | 2, 158, 764 | 2, 198, 452 |
| Lake trout | 325, 930 | 358, 838 | 440, 285 | 571, 102 | 1, 119, 198 | 1, 195, 155 |
| Mackerel (except Spanish) | 5, 569, 816 | 6, 121, 121 | 5, 898, 929 | 4, 716, 379 | 5, 026, 684 | 4, 800, 745 |
| Perch, yellow | 69, 865 | 159, 955 | 351, 681 | 448, 723 | 647, 337 | 561, 172 |
| Pike, blue and sauger | 147, 523 | 98, 681 | 42, 086 | 287, 683 | 614, 218 | 680, 130 |
| Pike, yellow or wall-eyed | 37, 605 | 31, 247 | 44, 065 | 62, 171 | 91, 906 | 91, 683 |
| Pike (including pickerel, jacks, and yellow jack) | 97, 783 | 85, 572 | 91, 116 | 86, 186 | 110, 160 | 100, 723 |
| Pollock fillets | 1, 890, 874 | 1, 076, 483 | 668, 928 | 575, 151 | 2, 183, 053 | 4, 738, 427 |
| Rosefish fillets | 2, 662, 701 | 3, 211, 384 | 3, 279, 896 | 2, 735, 026 | 2, 363, 086 | 1, 781, 938 |
| Sablefish (black cod) | 780, 461 | 1, 009, 656 | 1, 528, 982 | 2, 383, 369 | 2, 698, 573 | 2, 522, 399 |
| Salmon, king or chinook | 835, 004 | 1, 092, 219 | 1, 927, 962 | 3, 267, 374 | 3, 596, 899 | 3, 187, 585 |
| Salmon, silver or cohoe | 344, 880 | 2, 231, 912 | 5, 078, 926 | 6, 288, 278 | 6, 234, 127 | 5, 405, 252 |
| Salmon, fall and pink | 1, 100, 463 | 1, 208, 316 | 1, 244, 255 | 1, 546, 938 | 4, 450, 648 | 4, 156, 684 |
| Salmon, steelhead trout | 205, 072 | 389, 488 | 495, 043 | 559, 465 | 478, 565 | 441, 208 |
| Scup (porgies) | 275, 552 | 348, 334 | 360, 036 | 322, 889 | 316, 708 | 264, 049 |
| Shad and shad roe | 557, 359 | 541, 937 | 521, 149 | 561, 609 | 551, 405 | 559, 282 |
| Smelts, eulachon, etc | 799, 112 | 819, 172 | 920, 809 | 837, 295 | 710, 852 | 675, 837 |
| Sturgeon and spoonbill cat | 243, 713 | 296, 680 | 327, 136 | 417, 042 | 733, 328 | 896, 528 |
| Suckers | 64, 084 | 67, 786 | 60, 315 | 54, 086 | 44, 733 | 138, 658 |
| Swordfish | 625, 550 | 676, 064 | 891, 752 | 711, 095 | 548, 068 | 741, 839 |
| Weakfish (including southern "sea trout") | 557, 703 | 584, 091 | 660, 164 | 463, 553 | 453, 822 | 398, 998 |
| Whitefish | 1, 237, 119 | 1, 559, 841 | 1, 748, 239 | 1, 596, 226 | 1, 679, 478 | 1, 800, 598 |
| Whiting | 7, 588, 360 | 9, 151, 206 | 11, 140, 277 | 9, 693, 904 | 8, 905, 985 | 8, 228, 204 |
| Other fish | 7, 833, 842 | 8, 309, 399 | 8, 750, 634 | 10, 040, 670 | 10, 918, 308 | 10, 702, 718 |
| Total fish | 60, 366, 554 | 70, 458, 130 | 79, 085, 721 | 79, 159, 605 | 84, 819, 362 | 81, 392, 588 |
| FROZEN SHELLFISH | | | | | | |
| Scallops | 1, 232, 310 | 1, 359, 554 | 1, 863, 125 | 1, 733, 003 | 1, 694, 812 | 1, 644, 338 |
| Shrimp | 2, 262, 648 | 1, 490, 437 | 1, 063, 549 | 2, 125, 146 | 4, 388, 280 | 5, 547, 548 |
| Spiny lobster tails | 542, 979 | 468, 454 | 470, 036 | 457, 052 | 408, 531 | 360, 715 |
| Squid | 1, 646, 554 | 1, 594, 998 | 1, 395, 448 | 1, 150, 817 | 1, 120, 314 | 1, 078, 795 |
| Other shellfish | 665, 286 | 510, 188 | 659, 357 | 1, 039, 434 | 592, 632 | 687, 329 |
| Total shellfish | 6, 349, 777 | 5, 423, 631 | 5, 451, 515 | 6, 505, 452 | 8, 204, 569 | 9, 318, 725 |
| Total fish and shellfish | 66, 716, 331 | 75, 881, 761 | 84, 537, 236 | 85, 665, 057 | 93, 023, 931 | 90, 711, 313 |

*Holdings of frozen fishery products, 1938*—Continued

BY GEOGRAPHICAL SECTIONS AND MONTHS [1]

[Expressed in thousands of pounds; that is, 000 omitted]

| Month ended the 15th of— | New England | Middle Atlantic | South Atlantic | North Central, East | North Central, West | South Central | Pacific [2] | Total |
|---|---|---|---|---|---|---|---|---|
| January | 22,402 | 15,329 | 2,734 | 9,239 | 5,350 | 753 | 17,321 | 73,128 |
| February | 19,573 | 14,204 | 2,357 | 8,606 | 4,445 | 742 | 12,257 | 62,184 |
| March | 13,334 | 10,799 | 1,654 | 7,089 | 3,623 | 578 | 8,617 | 45,694 |
| April | 12,185 | 8,068 | 2,333 | 5,698 | 3,122 | 602 | 5,359 | 37,367 |
| May | 16,015 | 10,298 | 3,394 | 5,596 | 2,737 | 528 | 7,413 | 45,981 |
| June | 20,783 | 10,447 | 4,228 | 5,924 | 2,555 | 1,026 | 10,076 | 55,039 |
| July | 27,754 | 10,513 | 4,831 | 5,960 | 2,728 | 1,175 | 13,755 | 66,716 |
| August | 29,958 | 10,393 | 5,500 | 6,129 | 3,269 | 744 | 19,889 | 75,882 |
| September | 31,791 | 10,999 | 5,110 | 7,733 | 3,275 | 862 | 24,767 | 84,537 |
| October | 26,593 | 11,759 | 4,569 | 9,398 | 3,388 | 1,437 | 28,521 | 85,665 |
| November | 26,144 | 13,880 | 4,787 | 11,916 | 4,182 | 2,016 | 30,099 | 93,024 |
| December | 25,600 | 14,545 | 4,275 | 12,692 | 4,964 | 2,458 | 26,177 | 90,711 |
| Average | 22,678 | 11,770 | 3,814 | 7,998 | 3,636 | 1,077 | 17,021 | 67,994 |

[1] New England includes the 6 States of that section; Middle Atlantic—New York, New Jersey, and Pennsylvania; South Atlantic—Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida; North Central, East—Ohio, Indiana, Illinois, Michigan, and Wisconsin; North Central, West—Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas; South Central—Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Oklahoma, and Arkansas; and Pacific—Washington, Oregon, California, and Alaska.

[2] Includes a small amount of fish held in Colorado in the mountain section.

## COLD-STORAGE HOLDINGS OF CURED FISH

During 1938 monthly cold-storage holdings of cured herring averaged 15,216,977 pounds, while those of mild-cured salmon averaged 4,426,537 pounds. This is a decrease of 12 percent in the holdings of cured herring and 22 percent in the holdings of mild-cured salmon, as compared with the previous year. Stocks of cured herring were the largest during May, when the holdings amounted to 19,876,405 pounds; while the largest holdings of mild-cured salmon occurred in November, when 7,423,880 pounds were in storage.

*Holdings of cured fish, 1938, by species and months*

| Month ended the 15th of— | Cured herring | Mild-cured salmon | Total |
|---|---|---|---|
| | *Pounds* | *Pounds* | *Pounds* |
| January | 11,525,064 | 4,801,472 | 16,326,536 |
| February | 13,254,354 | 4,165,890 | 17,420,244 |
| March | 13,184,469 | 3,520,588 | 16,705,057 |
| April | 15,082,197 | 2,719,225 | 17,801,422 |
| May | 19,876,405 | 1,868,542 | 21,744,947 |
| June | 19,443,598 | 1,718,462 | 21,162,060 |
| July | 18,231,065 | 3,362,173 | 21,593,238 |
| August | 18,163,544 | 4,526,797 | 22,690,341 |
| September | 16,264,456 | 5,558,828 | 21,823,284 |
| October | 13,785,060 | 6,892,659 | 20,677,719 |
| November | 12,003,249 | 7,423,880 | 19,427,129 |
| December | 11,790,258 | 6,559,927 | 18,350,185 |

## FOREIGN FISHERY TRADE

The foreign trade in fishery products of the United States in 1938 amounted to $53,722,221, of which $39,307,089 represents the value of these products imported for consumption and $14,415,132, the value of exports of domestic fishery products. Compared with the previous year there was a decrease of 18 percent in total trade, 22 percent in the value of the imports, and 1 percent in the value of the exports.

Imports consisted of 302,623,795 pounds of edible products valued at $28,348,602, and nonedible products valued at $10,958,487. Fishery exports consisted of 118,029,159 pounds of edible products valued at $13,797,855, and nonedible products valued at $617,277.

Import duties levied on fishery products imported during 1938 totaled $5,700,534.

*Exports of domestic fishery products, 1938* [1]

| Item | Quantity | Value |
|---|---|---|
| EDIBLE FISHERY PRODUCTS | | |
| Fish, fresh or frozen: | | |
| Salmon ..... pounds | 6, 345, 069 | $706, 629 |
| Other ..... do | 1, 587, 445 | 139, 860 |
| Fish, salted, pickled, or dry-cured: | | |
| Salmon ..... do | 2, 162, 135 | 448, 796 |
| Cod, haddock, hake, pollock, cusk ..... do | 1, 656, 221 | 116, 997 |
| Fish, canned: | | |
| Salmon ..... do | 48, 290, 957 | 7, 269, 171 |
| Sardines ..... do | 40, 811, 807 | 2, 786, 163 |
| Shellfish, not canned: | | |
| Oysters, fresh, in the shell, shucked, frozen, or in ice ..... do | 5, 322, 624 | 374, 355 |
| Shrimp, fresh, frozen, or in ice ..... do | 382, 089 | 55, 211 |
| Shrimp, dried ..... do | 1, 709, 775 | 304, 307 |
| Shellfish, canned: | | |
| Shrimp ..... do | 5, 083, 489 | 993, 505 |
| Other ..... do | 1, 518, 475 | 249, 981 |
| Other fish and fish products ..... do | 3, 159, 073 | 352, 880 |
| Total edible products ..... do | 118, 029, 159 | 13, 797, 855 |
| NONEDIBLE FISHERY PRODUCTS | | |
| Marine-animal oils ..... do | 2, 677, 318 | 215, 600 |
| Fish meal for feed ..... tons | 1, 431 | 65, 061 |
| Furs, fur-seal, dressed ..... number | 5, 380 | 92, 500 |
| Oyster shells ..... tons | 36, 280 | 244, 116 |
| Total nonedible products | | 617, 277 |
| Grand total | | 14, 415, 132 |

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[1] These statistics have been furnished by the Bureau of Foreign and Domestic Commerce, Department of Commerce.

*Imports of fishery products entered for consumption, 1938* [1]

| Item | Pounds | Value |
|---|---|---|
| EDIBLE FISHERY PRODUCTS | | |
| Fish, fresh or frozen: | | |
| Whole or beheaded, or eviscerated, or both: | | |
| Fresh-water fish, not elsewhere specified: | | |
| Whitefish | 12, 194, 864 | $1, 495, 764 |
| Yellow pike | 7, 686, 110 | 730, 606 |
| Jacks or grass pike | 3, 222, 871 | 150, 529 |
| Lake trout | 4, 584, 587 | 512, 277 |
| Yellow perch | 2, 742, 343 | 187, 482 |
| Tullibees | 1, 094, 420 | 77, 886 |
| Lake herring and ciscoes | 1, 778, 837 | 286, 593 |
| Chubs | 1, 158, 019 | 147, 833 |
| Mullet (catostomus) | 749, 212 | 51, 342 |
| Saugers | 8, 187, 981 | 453. 701 |
| Fresh-water fish, not elsewhere specified | 5, 894, 783 | 348, 970 |
| Eels | 479, 986 | 35, 176 |
| Salmon | 5, 631, 822 | 605, 212 |
| Cod, haddock, hake, pollock, and cusk | 1, 521, 599 | 61, 182 |
| Halibut: | | |
| Fresh | 4, 549, 801 | 500, 861 |
| Frozen | 1, 371, 833 | 130, 311 |
| Mackerel | 1, 148, 885 | 67, 602 |
| Sturgeon | 1, 183, 565 | 291, 528 |
| Swordfish: | | |
| Fresh | 1, 231, 120 | 195, 168 |
| Frozen | 2, 965, 623 | 222, 801 |
| Fish, not specially provided for | 6, 256, 897 | 233, 322 |
| Whether or not whole: | | |
| Smelts | 7, 075, 018 | 671, 943 |
| Tuna fish | 13, 693, 727 | 803, 229 |
| Sea herring: | | |
| Fresh | 11, 628, 928 | 124, 879 |
| Frozen | 2, 171, 538 | 73, 215 |
| Filleted, skinned, boned, sliced, or divided, not specially provided for | 9, 454, 880 | 914, 565 |
| Total | 119, 659, 249 | 9, 373, 977 |
| Fish, salted, dried, smoked, pickled, or preserved: | | |
| Dried and unsalted: | | |
| Cod, haddock, hake, pollock, and cusk | 75, 666 | 5, 103 |
| Other (including stockfish) | 2, 733, 006 | 361. 905 |
| In oil or in oil and other substances: | | |
| Sardines: | | |
| Valued not over 9 cents per pound | [2] 4. 504 | 388 |
| Valued over 9 cents per pound | [2] 21, 849, 658 | 3, 219, 426 |
| Anchovies: | | |
| Valued not over 9 cents per pound | [2] 50 | 3 |
| Valued over 9 cents per pound | [2] 2, 061, 018 | 896, 924 |
| Tuna fish | 7, 192, 118 | 1, 252, 203 |
| Antipasto, valued over 9 cents per pound | [2] 210, 679 | 78, 752 |
| Other: | | |
| Valued not over 9 cents per pound | 60 | 5 |
| Valued over 9 cents per pound | 380, 879 | 79. 979 |
| Not in oil or in oil and other substances: | | |
| In airtight containers weighing, with contents, not over 15 pounds each: | | |
| Anchovies | 2, 019, 682 | 230, 627 |
| Salmon | 697, 645 | 67, 782 |
| Herring and sardines | [2] 9, 150, 160 | 778, 104 |
| Fish cakes, balls, and puddings | [2] 1, 648, 134 | 130, 783 |
| Other | 1, 137, 821 | 158. 582 |
| Pickled or salted: | | |
| Not in oil, etc., and not in airtight containers weighing, with contents, 15 pounds or less each: | | |
| Salmon | 224, 872 | 32, 663 |
| Cod, haddock, hake, pollock, and cusk, neither skinned nor boned (except that vertebral column may be removed): | | |
| Containing not more than 43 percent moisture by weight | 6, 142, 552 | 285, 810 |
| Containing more than 43 percent moisture by weight | 39, 824, 832 | 1, 533, 499 |
| Cod, haddock, hake, pollock, and cusk, skinned or boned | 2, 235, 675 | 201, 291 |
| Herring: | | |
| In containers (not airtight), weighing, with contents, not more than 15 pounds each | 440 | 36 |
| In containers containing not more than 10 pounds of herring | [3] 5. 882, 211 | 325, 447 |
| Other, in bulk or in containers | [3] 28, 321, 491 | 1, 168, 890 |
| Mackerel, in bulk or in containers weighing, with contents, more than 15 pounds each | [3] 5, 877, 536 | 304, 292 |
| Alewives, in bulk or in containers weighing, with contents, more than 15 pounds each | [3] 19. 016 | 850 |
| Pickled or salted, not specially provided for, in bulk or in containers weighing, with contents, more than 15 pounds each | [3] 1, 049, 993 | 83, 671 |

See footnotes at end of table.

*Imports of fishery products entered for consumption, 1938*—Continued

| Item | Pounds | Value |
|---|---|---|
| EDIBLE FISHERY PRODUCTS—continued | | |
| Fish, salted, dried, smoked, pickled, or preserved—Continued. | | |
| Smoked or kippered: | | |
| Not in oil, and not in airtight containers weighing, with contents, 15 pounds or less each: | | |
| Salmon | 3, 739 | $2, 128 |
| Herring: | | |
| Whole or beheaded: | | |
| Hard, dry-smoked | 1, 767, 310 | 54, 714 |
| Other | 348, 903 | 27, 766 |
| Boned, whether or not skinned | 64, 630 | 5, 777 |
| Eviscerated, split, skinned, or divided (not boned) | 762, 725 | 63, 203 |
| Cod, haddock, hake, pollock, and cusk: | | |
| Whole, or beheaded, or eviscerated or both | 741, 439 | 65, 670 |
| Filleted, skinned, boned, sliced, or divided | 1, 753, 099 | 177, 822 |
| Smoked or kippered, not specially provided for | 3, 268 | 671 |
| Fish paste and fish sauce | [2] 81, 677 | 18, 979 |
| Prepared or preserved, not specially provided for: | | |
| In containers weighing, with contents, not more than 15 pounds each | 92, 379 | 12, 575 |
| In bulk or in containers weighing, with contents, more than 15 pounds each | [3] 147, 295 | 14, 734 |
| Total | 144, 506, 162 | 11, 641, 054 |
| Cavair and other fish roe: | | |
| Not boiled: | | |
| Sturgeon | 107, 085 | 190, 887 |
| Fish roe, not specially provided for | 123, 563 | 25, 873 |
| Boiled, packed in airtight containers | [2] 77, 449 | 10, 019 |
| Total | 308, 097 | 226, 779 |
| Shellfish: | | |
| Crab meat, crab sauce, and crab paste | [2] 7, 814, 293 | 2, 741, 348 |
| Oysters, oyster juice, or either in combination with other substances, in airtight containers | [2] 166, 130 | 40, 580 |
| Razor clams, canned | [2] 4, 036 | 462 |
| Clams (except razor clams) and clams in combination with other substances (except clam chowder) | [2] 515, 858 | 105, 431 |
| Clam chowder, clam juice, and clam juice in combination with other substances | 826 | 149 |
| Lobsters (including spiny lobsters and crawfish): | | |
| Not canned | 14, 254, 249 | 2, 779, 605 |
| Canned | 727, 398 | 326, 129 |
| Turtles | 641, 017 | 33, 002 |
| Crabs, fresh or frozen (not crab meat) | 2, 177 | 187 |
| Clams, quahogs, not in airtight containers, fresh or frozen | 3, 123, 257 | 52, 904 |
| Shrimps and prawns | 3, 459, 558 | 240, 102 |
| Scallops: | | |
| Fresh but not frozen | 541, 840 | 90, 632 |
| Other | 750, 054 | 102, 244 |
| Oysters, not in airtight containers: | | |
| Fresh or frozen (except seed oysters) | 243, 775 | 2, 398 |
| Other | 1, 811, 565 | 76, 258 |
| Lobster paste and sauce | 14, 630 | 4, 665 |
| Pastes and sauces of shellfish, not specially provided for | 94, 086 | 9, 200 |
| Shellfish, not specially provided for | 3, 985, 538 | 501, 496 |
| Total | 38, 150, 287 | 7, 106, 792 |
| Total edible fishery products | 302, 623, 795 | 28, 348, 602 |
| NONEDIBLE FISHERY PRODUCTS | | |
| Marine-animal oils: | *Quantity* | |
| Cod oil gallons | 3, 057, 860 | 939, 481 |
| Cod-liver oil do | 5, 228, 637 | 3, 326, 496 |
| Eulachon oil do | 700 | 450 |
| Halibut-liver oil do | 3, 541 | 12, 635 |
| Herring oil do | 3, 964 | 982 |
| Seal oil do | 35 | 57 |
| Sod oil do | 56, 244 | 13, 855 |
| Whale oil: | | |
| Sperm: | | |
| Crude do | 1, 200, 733 | 351, 562 |
| Refined or otherwise processed do | 34, 728 | 11, 576 |
| Whale oil, not specially provided for do | 1, 707, 510 | 561, 694 |
| Marine-animal and fish oils, not specially provided for do | 10, 167 | 91, 267 |
| Total | 11, 304, 119 | 5, 310, 055 |

See footnotes at end of table

*Imports of fishery products entered for consumption, 1938*—Continued

| Item | Quantity | Value |
|---|---|---|
| NONEDIBLE FISHERY PRODUCTS—continued | | |
| Pearls and imitation pearls: | | |
| Pearls and parts, not strung or set: | | |
| Natural | | $247, 387 |
| Cultured or cultivated | | 222, 917 |
| Imitation pearls, half pearls, and hollow or filled | | 8, 700 |
| Imitation pearl beads: | | |
| Hollow or filled | | 41, 508 |
| Solid, except iridescent: | | |
| Valued at not more than ¼ cent per inch ... inches | 102, 456, 122 | 118, 840 |
| Valued at more than ¼ cent and not more than 1 cent per inch ... inches | 44, 773 | 219 |
| Total | | 639, 571 |
| Shells and buttons of pearl or shell: | | |
| Shells, unmanufactured: | | |
| Green snail shell, unmanufactured ... pounds | 62, 516 | 9, 429 |
| Mother-of-pearl ... do | 8, 024, 781 | 1, 273, 995 |
| Shells, not specially provided for, unmanufactured ... do | 11, 685, 310 | 49, 634 |
| Tortoise shell, not sawed, cut, flaked, polished, or otherwise manufactured or advanced in value from natural state ... pounds | 1, 056 | 5, 028 |
| Shells and mother-of-pearl, engraved, cut, ornamented, or manufactured | | 36, 044 |
| Pearl or shell buttons: | | |
| Fresh-water ... gross | 175, 743 | 38, 018 |
| Ocean ... do | 236, 812 | 72, 952 |
| Buttons (from Philippine Islands) ... do | 522, 169 | 196, 426 |
| Total | | 1, 681, 526 |
| Sponges: | | |
| Sheepswool ... pounds | 147, 236 | 284, 773 |
| Yellow and grass ... do | 202, 813 | 73, 042 |
| Velvet ... do | 30, 744 | 33, 808 |
| Other ... do | 47, 808 | 83, 531 |
| Manufactures of sponges, not specially provided for ... do | 63 | 84 |
| Total ... do | 428, 664 | 475, 238 |
| Agar-agar ... do | 588, 958 | 333, 238 |
| Ambergris ... do | 79 | 8, 251 |
| Cod-liver oil cake and cod-liver oil cake meal ... do | 1, 085, 419 | 21, 113 |
| Cuttlefish bone ... do | 298, 467 | 24, 774 |
| Goldfish ... number | 229, 958 | 2, 180 |
| Fish for other than human consumption | | 17, 583 |
| Fish livers ... pounds | 4, 931, 580 | 658, 057 |
| Fish sounds ... do | 172, 821 | 22, 461 |
| Fish scrap and fish meal, not fertilizer ... tons | 32, 922 | 1, 253, 231 |
| Fish scrap and fish meal, fertilizer ... do | 6, 965 | 253, 231 |
| Isinglass ... pounds | 95, 623 | 38, 146 |
| Kelp ... do | 2, 719, 380 | 9, 034 |
| Fish skins, raw or salted ... do | 1, 589, 126 | 74, 977 |
| Seal skins, raw (not fur skins) ... do | 1, 089, 141 | 99, 081 |
| Spermaceti wax ... do | 75, 180 | 14, 997 |
| Whalebone, unmanufactured | | 185 |
| Whalebone, manufactures of | | 957 |
| Aquarium fish, not elsewhere specified | | 20, 601 |
| Total | | 2, 852, 097 |
| Total, nonedible fishery products | | 10, 958, 487 |
| Grand total | | 39, 307, 089 |

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[1] These statistics have been furnished by the Bureau of Foreign and Domestic Commerce, Department of Commerce.

[2] Including weight of immediate container.

[3] Net weight.

# FISHERIES OF THE NEW ENGLAND STATES

(Area XXII) [6]

The yield of the commercial fisheries of the New England States (Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut) during 1938 amounted to 631,520,300 pounds valued at $18,275,182 to the fishermen, representing a decrease of 6 percent in volume and 8 percent in value as compared with the catch in 1937. These fisheries gave employment to 20,248 fishermen, as compared with 19,624 in 1937.

There were 421 fishery wholesale and manufacturing establishments in the 5 States in 1938, as compared with 400 in 1937. In 1938 these establishments employed 12,162 persons, paid $6,969,883 in salaries and wages, and produced manufactured products (canned, cured packaged, and byproducts) valued at $19,967,143. In 1937 the wholesale and manufacturing firms employed 12,122 persons, paid $7,705,479 in salaries and wages, and produced manufactured products valued at $24,038,947.

*Fisheries of the New England States, 1938*

SUMMARY OF CATCH

| Product | Maine | | New Hampshire | | Massachusetts | | Rhode Island | | Connecticut | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Fish | 50, 672, 500 | $729, 207 | 55, 500 | $4, 563 | 518, 357, 800 | $10, 876, 387 | 5, 957, 800 | $196, 492 | 6, 154, 500 | $207, 146 | 581, 198, 100 | $12, 013, 795 |
| Shellfish, etc | 16, 534, 100 | 1, 791, 643 | 740, 200 | 104, 572 | 19, 492, 700 | 2, 293, 000 | 7, 871, 100 | 859, 082 | 5, 684, 100 | 1, 213, 090 | 50, 322, 200 | 6, 261, 387 |
| Total | 67, 206, 600 | 2, 520, 850 | 795, 700 | 109, 135 | 537, 850, 500 | 13, 169, 387 | 13, 828, 900 | 1, 055, 574 | 11, 838, 600 | 1, 420, 236 | 631, 520, 300 | 18, 275, 182 |

OPERATING UNITS: BY STATES

| Item | Maine | New Hampshire | Massachusetts | Rhode Island | Connecticut | Total |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 484 | | 4, 109 | 252 | 278 | 5, 123 |
| On boats and shore: | | | | | | |
| Regular | 2, 394 | 120 | 3, 842 | 416 | 265 | 7, 037 |
| Casual | 3, 480 | 187 | 3, 051 | 714 | 656 | 8, 088 |
| Total | 6, 358 | 307 | 11, 002 | 1, 382 | 1, 199 | 20, 248 |
| Vessels: | | | | | | |
| Steam | | | 14 | 3 | 3 | 20 |
| Net tonnage | | | 2, 589 | 45 | 581 | 3, 215 |
| Motor | 122 | | 395 | 63 | 65 | 645 |
| Net tonnage | 1, 175 | | 16, 205 | 731 | 1, 202 | 19, 313 |
| Total vessels | 122 | | 409 | 66 | 68 | 665 |
| Total net tonnage | 1, 175 | | 18, 794 | 776 | 1, 783 | 22, 528 |

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[6] This is the number given this area by the North American Council on Fishery Investigations. It should be explained that there are included under this area craft whose principal fishing ports are in the area but at times fish elsewhere. Notable examples are the groundfish fishery in area XXI and the mackerel and southern trawl fisheries in area XXIII.

## *Fisheries of the New England States, 1938*—Continued

### OPERATING UNITS: BY STATES—Continued

| Item | Maine | New Hampshire | Massachusetts | Rhode Island | Connecticut | Total |
|---|---|---|---|---|---|---|
| Boats: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Motor | 1,947 | 38 | 1,920 | 367 | 238 | 4,510 |
| Other | 1,930 | 68 | 1,487 | 640 | 365 | 4,490 |
| Accessory boats | 174 |  | 417 | 59 | 11 | 661 |
| Apparatus: |  |  |  |  |  |  |
| Purse seines: |  |  |  |  |  |  |
| Mackerel | 10 |  | 68 | 1 | 1 | 80 |
| Length, yards | 3,070 |  | 32,248 | 120 | 150 | 35,588 |
| Other | 15 |  | 4 |  |  | 19 |
| Length, yards | 4,060 |  | 2,110 |  |  | 6,170 |
| Haul seines | 36 |  | 9 | 16 | 23 | 84 |
| Length, yards | 3,650 |  | 409 | 2,407 | 3,079 | 9,545 |
| Stop seines | 53 |  |  |  |  | 53 |
| Length, yards | 39,430 |  |  |  |  | 39,430 |
| Gill nets: |  |  |  |  |  |  |
| Anchor | 1,014 |  | 1,768 |  | 2 | 2,784 |
| Square yards | 318,116 |  | 578,055 |  | 375 | 896,546 |
| Drift | 530 |  | 3,369 | 16 | 42 | 3,957 |
| Square yards | 142,365 |  | 1,159,753 | 17,640 | 102,843 | 1,422,601 |
| Runaround |  |  |  |  | 1 | 1 |
| Square yards |  |  |  |  | 330 | 330 |
| Stake | 97 |  |  |  | 17 | 114 |
| Square yards | 7,338 |  |  |  | 2,699 | 10,037 |
| Lines: |  |  |  |  |  |  |
| Hand | 4,741 | 750 | 536 | 230 | 63 | 6,320 |
| Hooks | 5,140 | 750 | 1,101 | 279 | 80 | 7,350 |
| Trawl | 14,984 | 50 | 29,064 | 43 |  | 44,141 |
| Hooks | 832,500 | 2,500 | 1,824,640 | 19,053 |  | 2,678,693 |
| Troll |  |  |  | 64 |  | 64 |
| Hooks |  |  |  | 64 |  | 64 |
| Trot with hooks |  |  |  |  | 14 | 14 |
| Hooks |  |  |  |  | 1,600 | 1,600 |
| Pound nets |  |  | 128 | 21 | 15 | 164 |
| Floating traps | 17 |  | 57 | 37 |  | 111 |
| Weirs | 247 |  | 2 |  |  | 249 |
| Fyke nets | 27 |  | 26 | 38 | 49 | 140 |
| Dip nets | 65 |  | 189 | 29 | 131 | 414 |
| Bag nets | 107 | 31 |  |  |  | 138 |
| Push nets |  |  | 84 |  |  | 84 |
| Otter trawls | 60 |  | 351 | 35 | 63 | 509 |
| Yards at mouth | 1,419 |  | 10,453 | 828 | 1,463 | 14,163 |
| Box traps | 14 |  |  | 2 |  | 16 |
| Pots: |  |  |  |  |  |  |
| Crab | 200 |  | 5,634 |  |  | 5,834 |
| Eel | 173 |  | 775 | 1,087 | 1,894 | 3,929 |
| Fish |  |  |  |  | 24 | 24 |
| Lobster | 170,547 | 3,740 | 78,886 | 28,995 | 20,342 | 302,510 |
| Periwinkle and cockle |  |  | 104 | 1,033 |  | 1,137 |
| Harpoons | 62 |  | 99 | 49 | 13 | 223 |
| Spears | 5 |  | 38 | 24 | 2 | 69 |
| Dredges: |  |  |  |  |  |  |
| Clam |  |  | 90 | 12 |  | 102 |
| Yards at mouth |  |  | 43 | 12 |  | 55 |
| Mussel |  |  |  | 4 |  | 4 |
| Yards at mouth |  |  |  | 4 |  | 4 |
| Oyster | 1 |  | 43 | 32 | 74 | 150 |
| Yards at mouth | 2 |  | 44 | 48 | 104 | 198 |
| Scallop | 140 |  | 2,496 | 634 |  | 3,270 |
| Yards at mouth | 168 |  | 2,327 | 512 |  | 3,007 |
| Tongs: |  |  |  |  |  |  |
| Oyster |  |  | 43 | 57 | 44 | 144 |
| Other |  |  | 128 | 493 | 93 | 714 |
| Rakes: |  |  |  |  |  |  |
| Oyster |  |  |  | 36 | 3 | 39 |
| Other | 3 |  | 1,130 | 101 | 79 | 1,313 |
| Forks |  |  | 579 | 39 | 3 | 621 |
| Hoes | 2,146 | 105 | 1,599 | 51 | 25 | 3,926 |

## *Fisheries of the New England States, 1938*—Continued

### CATCH: By States

| Species | Maine | | New Hampshire | | Massachusetts | | Rhode Island | | Connecticut | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| FISH | | | | | | | | | | | | |
| Alewives | 3, 140, 100 | $12, 160 | | | 957, 800 | $6, 348 | 180, 600 | $1, 194 | 28, 300 | $283 | 4, 306, 800 | $19, 985 |
| Anchovies | | | | | | | 61, 000 | 670 | | | 61, 000 | 670 |
| Bluefish | | | | | 71, 100 | 5, 692 | 39, 400 | 3, 690 | 10, 100 | 1, 511 | 120, 600 | 10, 893 |
| Bonito | | | | | 6, 100 | 399 | 22, 200 | 2, 456 | | | 28, 300 | 2, 855 |
| Butterfish | 17, 800 | 976 | | | 1, 225, 800 | 46, 918 | 446, 300 | 17, 445 | 190, 300 | 3, 981 | 1, 880, 200 | 69, 320 |
| Carp | | | | | | | | | 35, 300 | 2, 094 | 35, 300 | 2, 094 |
| Cod | 6, 220, 600 | 124, 795 | 1, 500 | $45 | 111, 315, 200 | 2, 060, 590 | 735, 700 | 21, 885 | 111, 800 | 3, 354 | 118, 384, 800 | 2, 210, 669 |
| Crevalle | | | | | | | 900 | 14 | | | 900 | 14 |
| Croaker | | | | | 1, 729, 100 | 31, 927 | | | | | 1, 729, 100 | 31, 927 |
| Cunner | 45, 300 | 802 | | | | | 43, 900 | 439 | 1, 000 | 10 | 90, 200 | 1, 251 |
| Cusk | 1, 505, 900 | 27, 638 | 1, 000 | 28 | 6, 037, 800 | 102, 571 | | | | | 7, 544, 700 | 130, 237 |
| Drum, red | | | | | 1, 600 | 25 | | | | | 1, 600 | 25 |
| Eels: | | | | | | | | | | | | |
| Common | 85, 000 | 6, 771 | | | 284, 400 | 10, 168 | 88, 300 | 7, 575 | 55, 700 | 3, 444 | 513, 400 | 27, 958 |
| Conger | | | | | 114, 700 | 2, 280 | 10, 200 | 243 | 1, 100 | 16 | 126, 000 | 2, 539 |
| Flounders: | | | | | | | | | | | | |
| Gray sole | 763, 200 | 22, 835 | | | 7, 436, 700 | 291, 388 | | | | | 8, 199, 900 | 314, 223 |
| Lemon sole | 13, 200 | 265 | | | 3, 313, 600 | 214, 013 | | | | | 3, 326, 800 | 214, 278 |
| Yellowtail and dab | 397, 600 | 5, 853 | | | 17, 447. 100 | 373, 785 | 358, 200 | 5, 885 | 1, 757, 700 | 23, 722 | 19, 960, 600 | 409, 245 |
| Blackback | 590, 200 | 16, 493 | | | 8, 745, 800 | 305, 611 | 419, 700 | 14, 028 | 2, 527, 200 | 99, 885 | 12, 282, 900 | 436, 017 |
| Fluke | | | | | 1, 954, 600 | 141, 962 | 173, 300 | 13, 122 | 282, 600 | 20, 210 | 2, 410, 500 | 175, 294 |
| Unclassified | 50, 700 | 1, 414 | | | 603, 900 | 20, 891 | | | | | 654, 600 | 22, 305 |
| Frigate mackerel | | | | | | | 2, 000 | 20 | | | 2, 000 | 20 |
| Goosefish | | | | | 400 | 7 | | | | | 400 | 7 |
| Grayfish | | | | | 42, 400 | 1, 065 | 3, 800 | 46 | | | 46, 200 | 1, 111 |
| Haddock | 2, 508, 500 | 76, 974 | 2, 000 | 80 | 155, 424, 500 | 3, 375, 765 | | | | | 157, 935, 000 | 3, 452, 819 |
| Hake | 9, 048, 000 | 84, 983 | 3, 000 | 60 | 14, 764, 100 | 235, 811 | 4, 000 | 69 | 8, 000 | 140 | 23, 827, 100 | 321, 063 |
| Halibut | 39, 400 | 5, 595 | | | 1, 932, 600 | 200, 608 | | | | | 1, 972, 000 | 206, 203 |
| Herring, sea | 16, 055, 000 | 154, 768 | | | 4, 880, 700 | 36, 065 | 111, 200 | 689 | | | 21, 046, 900 | 191, 522 |
| Herring smelt | | | | | 500 | 10 | | | | | 500 | 10 |
| Hickory shad | | | | | | | 6, 700 | 148 | 400 | 4 | 7, 100 | 152 |
| King whiting or "kingfish" | | | | | 5, 200 | 107 | 2, 000 | 114 | 100 | 2 | 7, 300 | 223 |
| Lamprey | | | | | | | | | 1, 900 | 56 | 1, 900 | 56 |
| Mackerel | 1, 980, 900 | 45, 435 | | | 36, 832, 900 | 1, 103, 273 | 483, 200 | 14, 656 | 49, 900 | 1, 211 | 39, 346, 900 | 1, 164, 575 |
| Menhaden | | | | | 39, 100 | 322 | 131, 100 | 1, 197 | 157, 700 | 393 | 327, 900 | 1, 912 |
| Minnows | | | | | | | | | 600 | 79 | 600 | 79 |
| Pollock | 5, 919, 900 | 48, 843 | | | 34, 220, 800 | 397, 659 | 100, 100 | 1, 498 | 45, 900 | 676 | 40, 286, 700 | 448, 676 |
| Rosefish | 569, 600 | 6, 276 | | | 64, 435, 700 | 797, 148 | | | | | 65, 005, 300 | 803, 424 |
| Salmon | 15, 700 | 4, 720 | | | 500 | 92 | | | | | 16, 200 | 4, 812 |
| Scup or porgy | 100 | 2 | | | 9, 816, 600 | 252, 260 | 1, 145, 900 | 20, 582 | 121, 000 | 2, 435 | 11, 083, 600 | 275, 279 |
| Sea bass | | | | | 3, 603, 300 | 144, 057 | 67, 100 | 4, 947 | 56, 700 | 5, 620 | 3, 727, 100 | 154, 624 |
| Sea robin | | | | | 80, 500 | 1, 288 | 288, 600 | 2, 686 | 4, 000 | 80 | 373, 100 | 4, 054 |
| Shad | 11, 900 | 512 | | | 54, 500 | 2, 171 | 9, 600 | 981 | 426, 800 | 25, 788 | 502, 800 | 29, 452 |
| Sharks | 25, 900 | 339 | | | 123, 100 | 3, 340 | 3, 300 | 39 | | | 152, 300 | 3, 718 |

## *Fisheries of the New England States, 1938*—Continued

### CATCH: By States—Continued

| Species | Maine | | New Hampshire | | Massachusetts | | Rhode Island | | Connecticut | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| FISH—continued | | | | | | | | | | | | |
| Skates | | | | | 66, 200 | 994 | 221, 300 | 1, 714 | 66, 000 | 672 | 353, 500 | 3, 380 |
| Skipper or "billfish" | | | | | 800 | $116 | 600 | $60 | | | 1, 400 | $176 |
| Smelt | 692, 800 | $58, 302 | 48, 000 | $4, 350 | 25, 900 | 5, 101 | | | | | 766, 700 | 67, 753 |
| Spot | | | | | 8, 200 | 163 | | | | | 8, 200 | 163 |
| Squeteagues, or "sea trout," gray | | | | | 271, 700 | 6, 050 | 61, 100 | 3, 550 | 6, 200 | $261 | 339, 000 | 9, 861 |
| Striped bass | | | | | 81, 600 | 8, 586 | 210, 300 | 19, 867 | 9, 000 | 943 | 300, 900 | 29, 396 |
| Sturgeon | 500 | 28 | | | 8, 500 | 797 | 1, 900 | 240 | 200 | 69 | 11, 100 | 1, 134 |
| Suckers | 30, 500 | 762 | | | | | | | 93, 600 | 1, 831 | 124, 100 | 2, 593 |
| Swordfish | 59, 500 | 10, 326 | | | 1, 826, 100 | 307, 544 | 167, 900 | 25, 097 | 34, 000 | 7, 133 | 2, 087, 500 | 350, 100 |
| Tautog | | | | | 37, 500 | 1, 547 | 142, 300 | 5, 187 | 18, 700 | 457 | 198, 500 | 7, 191 |
| Tilefish | | | | | 367, 000 | 14, 445 | | | | | 367, 000 | 14, 445 |
| Tomcod | 7, 700 | 204 | | | 11, 000 | 578 | | | | | 18, 700 | 782 |
| Tuna | 181, 600 | 5, 146 | | | 1, 364, 900 | 50, 926 | 20, 900 | 2, 054 | | | 1, 567, 400 | 58, 126 |
| White perch | | | | | | | 2, 000 | 140 | | | 2, 000 | 140 |
| Whiting | 647, 500 | 5, 492 | | | 24, 203, 400 | 265, 612 | 191, 200 | 2, 265 | 52, 700 | 786 | 25, 094, 800 | 274, 155 |
| Wolffish | 47, 600 | 472 | | | 2, 564, 000 | 47, 811 | | | | | 2, 611, 600 | 48, 283 |
| Yellow perch | 300 | 26 | | | 18, 300 | 501 | | | | | 18, 600 | 527 |
| Total | 50, 672, 500 | 729, 207 | 55, 500 | 4, 563 | 518, 357, 800 | 10, 876, 387 | 5, 957, 800 | 196, 492 | 6, 154, 500 | 207, 146 | 581, 198, 100 | 12, 013, 795 |
| SHELLFISH, ETC. | | | | | | | | | | | | |
| Crabs: | | | | | | | | | | | | |
| Hard | 523, 300 | 14, 168 | | | 1, 292, 600 | 39, 742 | 229, 000 | 6, 977 | 2, 800 | 165 | 2, 047, 700 | 52, 052 |
| Soft and peelers | | | | | | | 300 | 100 | | | 300 | 100 |
| Lobsters | 7, 659, 200 | 1, 310, 013 | 170, 200 | 37, 272 | 2, 315, 100 | 499, 410 | 709, 700 | 159, 876 | 553, 600 | 136, 047 | 11, 407, 800 | 2, 142, 618 |
| Shrimp | 82, 500 | 5, 691 | | | 23, 200 | 1, 930 | | | | | 105, 700 | 7, 621 |
| Clams: | | | | | | | | | | | | |
| Hard, public [1] | 55, 000 | 4, 000 | | | 2, 294, 500 | 262, 656 | 2, 101, 100 | 176, 783 | 210, 500 | 43, 574 | 4, 661, 100 | 487, 013 |
| Hard, private [1] | | | | | 4, 200 | 518 | 63, 100 | 5, 750 | | | 67, 300 | 6, 268 |
| Razor | | | | | 512, 900 | 13, 859 | | | | | 512, 900 | 13, 859 |
| Soft, public [2] | 7, 134, 300 | 317, 951 | 570, 000 | 67, 300 | 4, 749, 700 | 436, 858 | 237, 100 | 16, 515 | 15, 500 | 2, 636 | 12, 706, 600 | 841, 260 |
| Soft, private [2] | | | | | 28, 000 | 2, 500 | | | | | 28, 000 | 2, 500 |
| Surf or skimmer | | | | | 1, 300 | 76 | | | | | 1, 300 | 76 |
| Limpets | | | | | | | 900 | 70 | | | 900 | 70 |
| Mussels, sea | 7, 200 | 175 | | | 15, 700 | 441 | 1, 200 | 180 | | | 24, 100 | 796 |
| Oysters, market: [3] | | | | | | | | | | | | |
| Public, spring | | | | | 7, 900 | 1, 430 | 42, 600 | 7, 948 | 14, 700 | 2, 662 | 65, 200 | 12, 040 |
| Public, fall | | | | | | | 40, 300 | 7, 537 | 29, 200 | 4, 803 | 69, 500 | 12, 340 |
| Private, spring | | | | | 219, 800 | 78, 315 | 1, 551, 100 | 193, 956 | 1, 983, 900 | 431, 100 | 3, 754, 800 | 703, 371 |
| Private, fall | | | | | | | 1, 950, 400 | 248, 084 | 2, 797, 400 | 578, 315 | 4, 747, 800 | 826, 399 |
| Periwinkles and cockles | 1, 800 | 150 | | | 9, 600 | 747 | 83, 100 | 4, 363 | | | 94, 500 | 5, 260 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Scallops: | | | | | | | | | | | | |
| Bay | | | | | 1, 095, 300 | 353, 229 | 64, 300 | 18, 382 | 66, 800 | 13, 624 | 1, 226, 400 | 385, 235 |
| Sea | 792, 900 | 86, 477 | | | 5, 057, 200 | 535, 406 | 400 | 118 | | | 5, 850, 500 | 622, 001 |
| Squid | 5, 200 | 52 | | | 1, 344, 800 | 16, 225 | 793, 400 | 12, 367 | 9, 700 | 164 | 2, 153, 100 | 28, 808 |
| Turtles: | | | | | | | | | | | | |
| Green | | | | | | | 3, 000 | 75 | | | 3, 000 | 75 |
| Loggerhead | | | | | | | 100 | 1 | | | 100 | 1 |
| Sea urchins | 97, 500 | 455 | | | | | | | | | 97, 500 | 455 |
| Irish moss | | | | | 177, 200 | 15, 714 | | | | | 177, 200 | 15, 714 |
| Kelp | | | | | 120, 000 | 720 | | | | | 120, 000 | 720 |
| Bloodworms | 116, 400 | 34, 884 | | | 26, 300 | 6, 289 | | | | | 142, 700 | 41, 173 |
| Sandworms | 58, 800 | 17, 627 | | | 197, 400 | 35, 935 | | | | | 256, 200 | 53, 562 |
| Total | 16, 534, 100 | 1, 791, 643 | 740, 200 | 104, 572 | 19, 492, 700 | 2, 293, 000 | 7, 871, 100 | 859, 082 | 5, 684, 100 | 1, 213, 090 | 50, 322, 200 | 6, 261, 387 |
| Grand total | 67, 206, 600 | 2, 520, 850 | 795, 700 | 109, 135 | 537, 850, 500 | 13, 169, 387 | 13, 828, 900 | 1, 055, 574 | 11, 838, 600 | 1, 420, 236 | 631, 520, 300 | 18, 275, 182 |

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[1] Statistics on hard clams are based on yields of 11 pounds of meats per standard bushel in Maine; 11.13 pounds in Massachusetts; 15.81 pounds in Rhode Island; and 12.04 pounds in Connecticut.

[2] Statistics on soft clams are based on yields of 15 pounds of meats per standard bushel in Maine and New Hampshire; 13.93 pounds in Massachusetts; and 20 pounds in Rhode Island and Connecticut.

[3] Statistics on oysters are based on yields of 6.57 pounds of meats per standard bushel in Massachusetts; 7 pounds in Rhode Island; and 7.63 pounds in Connecticut.

NOTES.—Data on the yield of shellfish meats per bushel are based on U. S. standard bushels of 2,150.4 cubic inches capacity. The above data includes the catch made by New England craft in the southern trawl fishery.

The seed oyster fishery in the New England States was prosecuted in Rhode Island and Connecticut. In Rhode Island, 24 fishermen, using 1 motorboat, 23 other boats, 4 tongs, and 20 rakes, took 39,050 bushesl of seed oysters, valued at $19,525 from public beds. Twenty-three of these fishermen are duplicated among those fishing for market oysters or other species. Similarly, the following craft and gear are duplicated: 23 rowboats, 3 tongs, and 20 rakes. In Connecticut, 335 fishermen, using 3 steam vessels, 17 motor vessels, 21 sail vessels, 22 motorboats, 81 other boats, 182 dredges, 92 tongs, and 7 rakes, took 80,584 bushels of seed oysters, valued at $64,784 from public beds, and 353,440 bushels, valued at $359,224 from private beds. Of the total number of persons fishing for seed oysters in Connecticut, 152 are duplicated among those fishing for market oysters or other species. Similarly, the following craft and gear are duplicated: 6 motor vessels, 18 motorboats, 65 other boats, 12 dredges, 72 tongs, and 3 rakes.

## *Fisheries of the New England States, 1938*—Continued

SUPPLEMENTARY TABLE SHOWING THE PRODUCTION OF CERTAIN SHELLFISH IN NUMBER AND BUSHELS

| Product | Maine | | New Hampshire | | Massachusetts | | Rhode Island | | Connecticut | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Crabs: | | | | | | | | | | | | |
| Hard ... number | 1,786,400 | $14,168 | | | 5,137,200 | $30,742 | 687,000 | $6,977 | 8,050 | $165 | 7,618,650 | $52,052 |
| Soft and peelers ... do | | | | | | | 1,200 | 100 | | | 1,200 | 100 |
| Clams: | | | | | | | | | | | | |
| Hard, public ... bushels | 5,000 | 4,000 | | | 206,155 | 262,656 | 132,897 | 176,783 | 17,483 | 43,574 | 361,535 | 487,013 |
| Hard, private ... do | | | | | 377 | 518 | 3,991 | 5,750 | | | 4,368 | 6,268 |
| Razor ... do | | | | | 17,051 | 13,859 | | | | | 17,051 | 13,859 |
| Soft, public ... do | 475,620 | 317,951 | 38,000 | $67,300 | 340,969 | 436,858 | 11,855 | 16,515 | 775 | 2,636 | 867,219 | 841,260 |
| Soft, private ... do | | | | | 2,010 | 2,500 | | | | | 2,010 | 2,500 |
| Surf or skimmer ... do | | | | | 76 | 76 | | | | | 76 | 76 |
| Limpets ... do | | | | | | | 69 | 70 | | | 69 | 70 |
| Mussels, sea ... do | 600 | 175 | | | 1,308 | 441 | 92 | 180 | | | 2,000 | 796 |
| Oysters, market: | | | | | | | | | | | | |
| Public, spring ... do | | | | | 1,202 | 1,430 | 6,086 | 7,948 | 1,927 | 2,662 | 9,215 | 12,040 |
| Public, fall ... do | | | | | | | 5,757 | 7,537 | 3,827 | 4,803 | 9,584 | 12,340 |
| Private, spring ... do | | | | | 33,455 | 78,315 | 221,586 | 193,956 | 260,013 | 431,100 | 515,054 | 703,371 |
| Private, fall ... do | | | | | | | 278,629 | 248,084 | 366,632 | 578,315 | 645,261 | 826,399 |
| Periwinkles and cockles ... do | 100 | 150 | | | 533 | 747 | 4,617 | 4,363 | | | 5,250 | 5,260 |
| Scallops: | | | | | | | | | | | | |
| Bay ... do | | | | | 182,550 | 353,229 | 9,186 | 18,382 | 10,277 | 13,624 | 202,013 | 385,235 |
| Sea ... do | 132,150 | 86,477 | | | 842,867 | 535,406 | 57 | 118 | | | 975,074 | 622,001 |

NOTE.—Bushels represent U. S. Standard Bushels of 2,150.4 cubic inches capacity.

*Industries related to the fisheries of the New England States, 1938*

OPERATING UNITS, SALARIES, AND WAGES

| Item | Maine and New Hampshire | Massachusetts | Rhode Island | Connecticut | Total |
|---|---|---|---|---|---|
| Transporting: | | | | | |
| Persons engaged: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 130 | 68 | 26 | 17 | 241 |
| On boats | 11 | 54 | -------- | -------- | 65 |
| Total | 141 | 122 | 26 | 17 | 306 |
| Vessels, motor | 65 | 9 | 8 | 9 | 91 |
| Net tonnage | 714 | 332 | 144 | 295 | 1,485 |
| Boats | 8 | 27 | -------- | -------- | 35 |
| Wholesale and manufacturing: | | | | | |
| Establishments | 150 | 212 | 29 | 30 | 421 |
| Persons engaged: | | | | | |
| Proprietors | 135 | 254 | 24 | 27 | 440 |
| Salaried employees | 164 | 514 | 39 | 37 | 754 |
| Wage earners: | | | | | |
| Average for season | 5,389 | 4,788 | 321 | 470 | 10,968 |
| Average for year | 1,638 | 3,958 | 189 | 253 | 6,038 |
| Paid to salaried employees | $259,012 | $1,553,622 | $83,190 | $115,205 | $2,011,029 |
| Paid to wage earners | $1,024,765 | $3,494,664 | $172,914 | $266,511 | $4,958,854 |
| Total salaries and wages | $1,283,777 | $5,048,286 | $256,104 | $381,716 | $6,969,883 |
| Fishermen manufacturing | 1,035 | 2,101 | 260 | -------- | 3,396 |

PRODUCTS MANUFACTURED

| Item | Maine [1] | | Massachusetts | | Rhode Island | | Connecticut | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments: | | | | | | | | |
| Alewives, salted pounds | 747,900 | $10,591 | (2) | (2) | -------- | -------- | -------- | -------- |
| Cod: | | | | | | | | |
| Fresh fillets do | 151,000 | 15,230 | 7,979,059 | $692,987 | (2) | (2) | -------- | -------- |
| Fresh sticks do | 310,900 | 34,865 | -------- | -------- | -------- | -------- | -------- | -------- |
| Frozen fillets do | 126,000 | 12,480 | 8,481,443 | 741,233 | -------- | -------- | -------- | -------- |
| Salted: | | | | | | | | |
| Green [3] do | 745,881 | 32,202 | -------- | -------- | -------- | -------- | -------- | -------- |
| Dry do | 110,000 | 6,650 | 1,994,061 | 148,980 | -------- | -------- | -------- | -------- |
| Boneless including absolutely boneless pounds | 297,294 | 39,475 | 7,425,378 | 1,078,918 | -------- | -------- | -------- | -------- |
| Smoked fillets do | 93,011 | 9,750 | 529,323 | 59,420 | -------- | -------- | -------- | -------- |
| Oil: | | | | | | | | |
| Cod gallons | 4,604 | 1,308 | -------- | -------- | -------- | -------- | -------- | -------- |
| Cod liver do | 20,565 | 11,409 | 240,991 | 153,577 | -------- | -------- | -------- | -------- |
| Cusk: | | | | | | | | |
| Fresh fillets pounds | 69,250 | 7,100 | 1,022,535 | 98,432 | -------- | -------- | -------- | -------- |
| Fresh sticks do | 636,300 | 65,788 | -------- | -------- | -------- | -------- | -------- | -------- |
| Frozen fillets do | (2) | (2) | 183,915 | 14,713 | -------- | -------- | -------- | -------- |
| Smoked fillets do | 64,000 | 6,550 | 689,223 | 68,230 | -------- | -------- | -------- | -------- |
| Flounders: | | | | | | | | |
| Fresh fillets do | 45,500 | 5,424 | 1,551,514 | 245,681 | -------- | -------- | -------- | -------- |
| Frozen fillets do | (2) | (2) | 1,677,810 | 244,401 | -------- | -------- | -------- | -------- |
| Haddock: | | | | | | | | |
| Fresh fillets do | 148,500 | 23,635 | 16,013,963 | 1,510,178 | (2) | (2) | -------- | -------- |
| Fresh sticks do | 73,000 | 11,300 | -------- | -------- | -------- | -------- | -------- | -------- |
| Frozen fillets do | 59,000 | 6,150 | 21,144,405 | 1,376,205 | -------- | -------- | -------- | -------- |
| Finnan haddie do | 184,900 | 17,507 | 505,809 | 41,551 | (2) | (2) | -------- | -------- |
| Hake: | | | | | | | | |
| Fresh fillets do | 213,000 | 19,250 | 2,205,091 | 177,890 | -------- | -------- | -------- | -------- |
| Fresh sticks do | 674,800 | 65,432 | -------- | -------- | -------- | -------- | -------- | -------- |
| Frozen fillets do | (2) | (2) | 301,948 | 15,385 | -------- | -------- | -------- | -------- |
| Salted: | | | | | | | | |
| Green [3] do | 1,872,842 | 59,542 | -------- | -------- | -------- | -------- | -------- | -------- |
| Dry do | (2) | (2) | 936,059 | 53,948 | -------- | -------- | -------- | -------- |
| Boneless, including absolutely boneless pounds | 207,538 | 15,695 | -------- | -------- | -------- | -------- | -------- | -------- |

See footnotes, p. 287.

*Industries related to the fisheries of the New England States, 1938*—Continued

PRODUCTS MANUFACTURED—Continued

| Item | Maine | | Massachusetts | | Rhode Island | | Connecticut | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments—Continued: | | | | | | | | |
| Herring, sea: | | | | | | | | |
| Salted: | | | | | | | | |
| Split---pounds-- | (2) | (2) | 165,500 | $7,457 | -------- | -------- | -------- | -------- |
| Brine salted pounds-- | 382,000 | $11,870 | -------- | -------- | -------- | -------- | -------- | -------- |
| Pickled in vinegar---pounds-- | 364,200 | 14,472 | (2) | (2) | -------- | -------- | -------- | -------- |
| Smoked: | | | | | | | | |
| Bloaters: | | | | | | | | |
| Hard-do---- | 66,150 | 2,685 | (2) | (2) | -------- | -------- | -------- | -------- |
| Soft---do--- | 335,140 | 14,837 | 156,000 | 13,191 | -------- | -------- | -------- | -------- |
| Boneless--do --- | 1,990,214 | 242,867 | (2) | (2) | -------- | -------- | -------- | -------- |
| Lengthwise pounds-- | 81,160 | 4,367 | -------- | -------- | -------- | -------- | -------- | -------- |
| Medium scaled pounds-- | 155,438 | 9,144 | (2) | (2) | -------- | -------- | -------- | -------- |
| Kippered-do---- | (2) | (2) | 117,179 | 16,568 | -------- | -------- | -------- | -------- |
| Canned "sardines" std. cases-- | 671,635 | 2,367,045 | -------- | -------- | -------- | -------- | -------- | -------- |
| Meal-------- tons - | 1,652 | 42,974 | -------- | -------- | -------- | -------- | -------- | -------- |
| Oil------ gallons-- | 56,452 | 6,132 | -------- | -------- | -------- | -------- | -------- | -------- |
| Mackerel: | | | | | | | | |
| Fresh fillets pounds-- | -------- | -------- | 127,302 | 23,082 | -------- | -------- | -------- | -------- |
| Frozen fillets--do- -- | -------- | -------- | 485,355 | 33,439 | -------- | -------- | -------- | -------- |
| Salted, split---do---- | -------- | -------- | 1,784,690 | 157,547 | -------- | -------- | -------- | -------- |
| Smoked-------do--- | -------- | -------- | 123,720 | 21,519 | -------- | -------- | -------- | -------- |
| Pollock: | | | | | | | | |
| Fresh fillets---do---- | 135,000 | 7,310 | 2,540,458 | 166,748 | -------- | -------- | -------- | -------- |
| Fresh sticks---do---- | 49,200 | 2,570 | -------- | -------- | -------- | -------- | -------- | -------- |
| Frozen fillets--do---- | 1,182,000 | 71,560 | 9,388,535 | 490,582 | -------- | -------- | -------- | -------- |
| Salted: | | | | | | | | |
| Green[3]----do-- | 386,611 | 10,498 | -------- | -------- | -------- | -------- | -------- | -------- |
| Dry-------do -- | 84,000 | 3,863 | 248,225 | 11,122 | -------- | -------- | -------- | -------- |
| Rosefish: | | | | | | | | |
| Fresh fillets---do---- | (2) | (2) | 6,051,632 | 476,397 | -------- | -------- | -------- | -------- |
| Frozen fillets--do---- | 365,000 | 32,300 | 12,720,359 | 1,057,018 | -------- | -------- | -------- | -------- |
| Whitefish, smoked pounds-- | -------- | -------- | 240,500 | 97,450 | -------- | -------- | -------- | -------- |
| Whiting: | | | | | | | | |
| Fresh fillets---do---- | -------- | -------- | 345,900 | 25,690 | -------- | -------- | -------- | -------- |
| Frozen fillets--do---- | (2) | (2) | 530,615 | 35,752 | -------- | -------- | -------- | -------- |
| Frozen sticks--do---- | -------- | -------- | 1,173,794 | 71,665 | -------- | -------- | -------- | -------- |
| Pan-dressed--do---- | -------- | -------- | 5,251,639 | 192,662 | -------- | -------- | -------- | -------- |
| Wolffish: | | | | | | | | |
| Fresh fillets---do---- | -------- | -------- | 78,537 | 7,894 | -------- | -------- | -------- | -------- |
| Frozen fillets--do---- | (2) | (2) | 123,200 | 13,004 | -------- | -------- | -------- | -------- |
| Crab meat, packaged, fresh-cooked--pounds-- | 104,250 | 44,303 | 229,036 | 77,272 | (2) | (2) | -------- | -------- |
| Lobster meat, packaged, fresh-cooked--pounds-- | 9,450 | 10,950 | 200,379 | 213,844 | -------- | -------- | -------- | -------- |
| Clams, hard, fresh-shucked------gallons-- | -------- | -------- | (2) | (2) | 3,545 | $5,829 | -------- | -------- |
| Clams, soft: | | | | | | | | |
| Fresh-shucked gallons-- | [4] 121,060 | [4] 135,172 | 333,154 | 471,190 | 7,875 | 8,665 | -------- | -------- |
| Canned: | | | | | | | | |
| Whole std. cases-- | 119,612 | 439,384 | -------- | -------- | -------- | -------- | -------- | -------- |
| Juice, bouillon, and cocktail std. cases-- | 23,151 | 41,267 | -------- | -------- | -------- | -------- | -------- | -------- |
| Chowder-do---- | 42,716 | 135,028 | (2) | (2) | -------- | -------- | -------- | -------- |
| Oysters, fresh-shucked gallons-- | -------- | -------- | (2) | (2) | 281,003 | 530,080 | 254,421 | $505,848 |
| Unclassified products: | | | | | | | | |
| Fillets, fresh and frozen----pounds-- | [5] 452,000 | [5] 54,030 | (6) | (6) | (6) | (6) | -------- | -------- |
| Steaks, fresh and frozen----pounds-- | -------- | -------- | [7] 289,486 | [7] 31,753 | -------- | -------- | -------- | -------- |
| Salted ------- do---- | [8] 231,058 | [8] 8,871 | [9] 2,032,064 | [9] 148,521 | -------- | -------- | -------- | -------- |
| Smoked ----- do---- | (6) | (6) | [10] 590,341 | [10] 97,763 | (6) | (6) | (6) | (6) |
| Canned: | | | | | | | | |
| Fish cakes, balls, etc. std. cases-- | (6) | (6) | 81,084 | 572,946 | -------- | -------- | -------- | -------- |
| Cat and dog food std. cases-- | -------- | -------- | 61,363 | 111,065 | -------- | -------- | -------- | -------- |
| Other-----do---- | [11] 57,134 | [11] 336,488 | [12] 71,143 | [12] 506,987 | (6) | (6) | -------- | -------- |

See footnotes, p. 287.

*Industries related to the fisheries of the New England States, 1938*—Continued

PRODUCTS MANUFACTURED—Continued

| Item | Maine | | Massachusetts | | Rhode Island | | Connecticut | |
|---|---|---|---|---|---|---|---|---|
| By manufacturing establishments—Continued. | | | | | | | | |
| Unclassified products—Continued. | | | | | | | | |
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Meal, miscellaneous tons | [13] 327 | [13] $20,610 | [14] 12,987 | [14] $581,697 | -------- | -------- | -------- | -------- |
| Oil, miscellaneous liver gallons | -------- | -------- | [15] 11,900 | [15] 501,960 | -------- | -------- | -------- | -------- |
| Glue do | -------- | -------- | 361,961 | 749,380 | -------- | -------- | -------- | -------- |
| Miscellaneous | -------- | [16] 307,036 | -------- | [17] 161,337 | -------- | [18] $195,524 | ([19]) | ([19]) |
| Total | -------- | 4,854,966 | -------- | 13,866,231 | -------- | 740,098 | 254,421 | $505,848 |
| By fishermen: | | | | | | | | |
| Alewives, smoked pounds | 158,000 | 8,255 | 6,000 | 470 | 1,100 | 22 | -------- | -------- |
| Cod: | | | | | | | | |
| Salted: | | | | | | | | |
| Green [3] do | 10,000 | 375 | 66,900 | 1,947 | -------- | -------- | -------- | -------- |
| Dry do | 2,000 | 160 | -------- | -------- | -------- | -------- | -------- | -------- |
| Roe do | -------- | -------- | -------- | -------- | 94 | 19 | -------- | -------- |
| Cusk, salted, green [3] pounds | -------- | -------- | 600 | 12 | -------- | -------- | -------- | -------- |
| Hake, salted, green [3] pounds | -------- | -------- | 300 | 5 | -------- | -------- | -------- | -------- |
| Halibut, salted, green [3] pounds | -------- | -------- | 4,900 | 398 | -------- | -------- | -------- | -------- |
| Mackerel, salted, split pounds | -------- | -------- | 400 | 14 | -------- | -------- | -------- | -------- |
| Pollock, salted, green [3] pounds | 50,000 | 1,250 | 2,300 | 57 | -------- | -------- | -------- | -------- |
| Crab meat, packaged, fresh-cooked pounds | 2,730 | 956 | 200 | 91 | -------- | -------- | -------- | -------- |
| Lobster meat, packaged, fresh-cooked pounds | -------- | -------- | 700 | 915 | -------- | -------- | -------- | -------- |
| Clams, hard, fresh-shucked gallons | -------- | -------- | -------- | -------- | 250 | 437 | -------- | -------- |
| Clams, razor, fresh-shucked gallons | -------- | -------- | 28,280 | 11,443 | -------- | -------- | -------- | -------- |
| Clams, soft: | | | | | | | | |
| Fresh-shucked gallons | [4] 71,554 | [4] 63,685 | 23,601 | 31,022 | -------- | -------- | -------- | -------- |

[1] A small quantity of manufactured products which were produced in New Hampshire have been included with those of Maine.

[2] This item has been included under "Unclassified products."

[3] This item is usually an intermediate product, and although included in the total, may be shown in the final stage of processing in this or another State.

[4] Includes New Hampshire production.

[5] Includes fresh fillets of rosefish; and frozen fillets of cusk, flounder, hake, whiting, and wolffish.

[6] The production of this item has been included under "Miscellaneous."

[7] Includes fresh steaks of cod; and frozen steaks of cod, haddock, halibut, pollock, salmon, swordfish, and wolffish.

[8] Includes green salted cusk, and haddock; dry salted cusk, haddock, and hake; salted boneless cusk and pollock; brine salted mackerel, and split sea herring.

[9] Includes dry salted cusk, and haddock; salted boneless cusk, haddock, and pollock; salted mackerel fillets and alewives.

[10] Includes smoked butterfish, alewives, flounders, halibut, lake trout, salmon, shad, and carp; smoked fillets of haddock, and pollock; smoked boneless and medium scaled herring, and hard bloaters.

[11] Includes canned finnan haddie; fish cakes, flakes, and chowder; alewife roe, and crab meat.

[12] Includes canned alewives, tuna, mackerel, finnan haddie, salted cod, groundfish roe, fish flakes, haddock chowder, soft and hard clam chowder, and canned fish for rat-poison bait.

[13] Includes clam, ground-fish, and miscellaneous fish meals.

[14] Includes rosefish, ground-fish, and miscellaneous fish meals.

[15] Includes halibut, sablefish, tuna, swordfish, shark, and mixed liver oils.

[16] Includes alewives pickled in vinegar; smoked pollock fillets, and kippered herring; pearl essence, kelp products; herring dry scrap and pomace; and marine-shell buttons. There also is included in this item a production of smoked butterfish, carp, chub, cisco, salmon, spoonbill cat, and common eels, which was produced in Connecticut.

[17] Includes fresh fillets of halibut, red snapper, and striped bass; frozen fillets of halibut and salmon; sea herring pickled in vinegar; and fresh-shucked hard clams, oysters, and bay scallops.

[18] Includes fresh fillets of cod and haddock; smoked finnan haddie; canned hard clam chowder; fresh-cooked crab and lobster meat; and miscellaneous marine-shell products.

[19] A small production of smoked butterfish, carp, chub, cisco, salmon, spoonbill cat and eels has been included under "Miscellaneous" for Maine.

NOTE.—The total value of manufactured products for the New England States was as follows: By manufacturing establishments, $19,967,143; and by fishermen, $1,216,024. Some of the above products may have been manufactured from products imported from another State or a foreign country, therefore, they cannot be correlated directly with the catch within the State. All of the persons engaged in the preparation of fishermen's manufactured products have also been included as fishermen, and 50 of the persons shown on transporting craft have also been included as fishermen. This should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## *Industries related to fisheries of the New England States, 1938*—Continued

### PRODUCTS MANUFACTURED—Continued

| Item | Maine | | Massachusetts | | Rhode Island | | Connecticut | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By fishermen—Continued. | | | | | | | | |
| Clams, soft—Continued. | | | | | | | | |
| Steamed meats pounds | 272, 745 | $21, 238 | | | | | | |
| Pickled gallons | 80 | 160 | | | | | | |
| Oysters, fresh-shucked gallons | | | 1, 000 | $2, 200 | 1, 624 | $3, 003 | | |
| Scallops: | | | | | | | | |
| Bay, fresh-shucked gallons | | | 88, 480 | 289, 457 | 7, 041 | 24, 687 | | |
| Sea, fresh-shucked gallons | 88, 270 | 86, 352 | 585, 580 | 667, 233 | 46 | 161 | | |
| Total | | 182, 431 | | 1, 005, 264 | | 28, 329 | | |
| Grand total | | 5, 037, 397 | | 14, 871, 495 | | 768, 427 | 254, 421 | $505, 848 |

## MAINE

### *Fisheries of Maine, 1938*

### OPERATING UNITS: BY GEAR

| Item | Purse seines | | Haul seines | Stop seines | Gill nets | | | Lines | |
|---|---|---|---|---|---|---|---|---|---|
| | Mackerel | Other | | | Anchor | Drift | Stake | Hand | Trawl |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 26 | 47 | | 127 | 95 | 19 | | 10 | 133 |
| On boats and shore: | | | | | | | | | |
| Regular | 20 | 16 | 47 | 75 | 28 | 41 | 1 | 164 | 308 |
| Casual | | | 39 | 7 | 49 | 5 | 34 | 838 | 64 |
| Total | 46 | 63 | 86 | 209 | 172 | 65 | 35 | 1, 012 | 505 |
| Vessels, motor | 5 | 10 | | 32 | 18 | 6 | | 4 | 23 |
| Net tonnage | 40 | 77 | | 293 | 167 | 55 | | 24 | 296 |
| Boats: | | | | | | | | | |
| Motor | 5 | 4 | 33 | 22 | 17 | 30 | | 150 | 238 |
| Other | 9 | 7 | 38 | 60 | 33 | 1 | 22 | 2 | 1 |
| Accessory boats | 8 | 9 | | 90 | | | | | 66 |
| Apparatus: | | | | | | | | | |
| Number | 10 | 15 | 36 | 53 | 1, 014 | 530 | 97 | 4, 741 | 14, 984 |
| Length, yards | 3, 070 | 4, 060 | 3, 650 | 39, 430 | | | | | |
| Square yards | | | | | 318, 116 | 142, 365 | 7, 338 | | |
| Hooks, baits, or snoods | | | | | | | | 5, 140 | 832, 500 |

| Item | Floating traps | Weirs | Fyke nets | Dip nets | Bag nets | Otter trawls | Box traps | Pots, crab |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | | | 72 | | |
| On boats and shore: | | | | | | | | |
| Regular | 31 | 253 | | 9 | 33 | 59 | | 4 |
| Casual | 3 | 109 | 5 | 73 | 46 | 7 | 20 | |
| Total | 34 | 362 | 5 | 82 | 79 | 138 | 20 | 4 |
| Vessels, motor | | | | | | 23 | | |
| Net tonnage | | | | | | 241 | | |
| Boats: | | | | | | | | |
| Motor | 14 | 31 | | | | 46 | | 4 |
| Other | 28 | 352 | 5 | 13 | 12 | | 11 | 1 |
| Apparatus: | | | | | | | | |
| Number | 17 | 247 | 27 | 65 | 107 | 60 | 14 | 200 |
| Yards at mouth | | | | | | 1, 419 | | |

## *Fisheries of Maine, 1938*—Continued

### OPERATING UNITS: BY GEAR—Continued

| Item | Pots—Contd. | | Harpoons | Spears | Dredges | | Rakes, other than for oysters | Hoes | By hand, other than for oysters | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|
| | Eel | Lobster | | | Oyster | Scallop | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | 30 | 19 | | 1 | 27 | | | | 484 |
| On boats and shore: | | | | | | | | | | |
| Regular | 3 | 1,682 | 71 | | | 95 | 3 | 580 | 3 | 2,394 |
| Casual | 9 | 929 | 27 | 5 | | 36 | | 1,566 | | 3,480 |
| Total | 12 | 2,641 | 117 | 5 | 1 | 158 | 3 | 2,146 | 3 | 6,358 |
| Vessels, motor | | 27 | 3 | | 1 | 5 | | | | 122 |
| Net tonnage | | 165 | 78 | | 8 | 72 | | | | 1,175 |
| Boats: | | | | | | | | | | |
| Motor | | 1,709 | 59 | | | 89 | | | | 1,947 |
| Other | 9 | 761 | | 5 | | | 3 | 735 | | 1,930 |
| Accessory boats | | | 2 | | | | | | | 174 |
| Apparatus: | | | | | | | | | | |
| Number | 173 | 170,547 | 62 | 5 | 1 | 140 | 3 | 2,146 | | |
| Yards at mouth | | | | | 2 | 166 | | | | |

### CATCH: BY GEAR

| Species | Purse seines | | | | Haul seines | | Stop seines | |
|---|---|---|---|---|---|---|---|---|
| | Mackerel | | Other | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 26,400 | $309 | 640,400 | $1,763 | | | | |
| Butterfish | 100 | 4 | 1,400 | 66 | | | | |
| Herring, sea | 152,700 | 1,501 | 647,500 | 5,325 | 227,200 | $1,930 | 10,183,600 | $109,686 |
| Mackerel | 348,800 | 8,859 | 284,000 | 7,013 | | | | |
| Pollock | 532,200 | 3,422 | 876,400 | 6,001 | | | | |
| Shad | 1,800 | 19 | | | | | | |
| Smelt | | | | | 207,300 | 15,563 | | |
| Whiting | | | | | 12,000 | 110 | | |
| Total | 1,062,000 | 14,114 | 2,449,700 | 20,168 | 446,500 | 17,603 | 10,183,600 | 109,686 |

| Species | Gill nets | | | | | | Lines | |
|---|---|---|---|---|---|---|---|---|
| | Anchor | | Drift | | Stake | | Hand | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 100 | $4 | 4,200 | $27 | | | | |
| Cod | 2,231,100 | 53,354 | 100 | 1 | | | 413,000 | $6,829 |
| Cusk | 15,000 | 235 | | | | | 600 | 11 |
| Flounders: | | | | | | | | |
| Gray sole | 700 | 12 | | | | | | |
| Yellowtail and dab | 2,200 | 16 | | | | | | |
| Blackback | 2,400 | 57 | | | | | | |
| Unclassified | 300 | 4 | | | | | 1,000 | 85 |
| Haddock | 527,300 | 15,630 | | | | | 28,000 | 881 |
| Hake | 1,266,700 | 15,120 | 300 | 2 | | | 29,600 | 292 |
| Halibut | 200 | 22 | | | | | 3,500 | 562 |
| Mackerel | 200 | 7 | 191,000 | 7,410 | | | | |
| Pollock | 4,006,200 | 34,438 | | | | | 153,900 | 1,505 |
| Rosefish | 3,400 | 27 | 200 | 1 | | | | |
| Shad | 6,900 | 329 | 600 | 17 | 500 | $78 | | |
| Sharks | 23,800 | 302 | 1,300 | 24 | | | | |
| Smelt | 31,400 | 3,755 | | | 16,500 | 1,165 | 250,800 | 21,671 |
| Sturgeon | 300 | 14 | | | | | | |
| Tuna | | | | | | | 9,800 | 295 |
| Whiting | 6,000 | 51 | 4,600 | 31 | | | | |
| Wolffish | 2,100 | 22 | | | | | | |
| Total | 8,126,300 | 123,399 | 202,300 | 7,513 | 17,000 | 1,243 | 890,200 | 32,131 |

## *Fisheries of Maine, 1938*—Continued

### CATCH: By gear—Continued

| Species | Lines—Continued | | Floating traps | | Weirs | | Fyke nets | |
|---|---|---|---|---|---|---|---|---|
| | Trawl | | | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 2,800 | $14 | 535,000 | $2,404 | | |
| Butterfish | | | 16,100 | 896 | | | | |
| Cod | 3,076,200 | $52,152 | | | | | | |
| Cunners | 45,300 | 802 | | | | | | |
| Cusk | 1,459,900 | 26,985 | | | | | | |
| Eels, common | | | | | | | 300 | $23 |
| Flounders: | | | | | | | | |
| Gray sole | 9,200 | 261 | | | | | | |
| Yellowtail and dabs | 11,400 | 116 | | | | | | |
| Blackback | 1,600 | 25 | | | | | | |
| Unclassified | 5,000 | 110 | | | 3,000 | 40 | | |
| Haddock | 1,368,500 | 42,717 | | | | | | |
| Hake | 6,586,500 | 59,773 | | | | | | |
| Halibut | 31,700 | 4,929 | | | | | | |
| Herring, sea | | | 189,000 | 1,560 | 4,654,400 | 34,759 | | |
| Mackerel | | | 735,100 | 17,679 | 421,800 | 4,467 | | |
| Pollock | 339,000 | 3,389 | 2,000 | 11 | | | | |
| Rosefish | 16,100 | 159 | | | | | | |
| Salmon | | | 5,700 | 1,451 | 9,900 | 3,249 | | |
| Shad | | | 1,800 | 65 | | | | |
| Sharks | 600 | 9 | | | | | | |
| Smelt | | | | | 22,100 | 2,298 | | |
| Suckers | | | | | | | 30,500 | 762 |
| Swordfish | 100 | 12 | | | | | | |
| Tomcod | | | | | | | 2,700 | 54 |
| Tuna | 200 | 5 | 100 | 3 | | | | |
| Wolffish | 36,500 | 380 | | | | | | |
| Yellow perch | | | | | | | 300 | 26 |
| Squid | | | 5,200 | 52 | | | | |
| Total | 12,990,800 | 192,124 | 957,800 | 21,731 | 5,646,200 | 47,217 | 33,800 | 865 |

| Species | Dip nets | | Bag nets | | Otter trawls | | Box traps | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 1,931,100 | $7,636 | | | 100 | $3 | | |
| Butterfish | | | | | 200 | 10 | | |
| Cod | | | | | 500,200 | 12,159 | | |
| Cusk | | | | | 30,400 | 407 | | |
| Eels, common | | | | | | | 45,000 | $4,370 |
| Flounders: | | | | | | | | |
| Gray sole | | | | | 753,300 | 22,562 | | |
| Lemon sole | | | | | 13,200 | 265 | | |
| Yellowtail and dab | | | | | 384,000 | 5,721 | | |
| Blackback | | | | | 586,200 | 16,411 | | |
| Unclassified | | | | | 41,400 | 1,175 | | |
| Haddock | | | | | 584,700 | 17,746 | | |
| Hake | | | | | 1,164,900 | 9,796 | | |
| Halibut | | | | | 1,000 | 82 | | |
| Herring, sea | | | | | 600 | 7 | | |
| Pollock | | | | | 10,200 | 77 | | |
| Rosefish | | | | | 549,900 | 6,089 | | |
| Salmon | 100 | 20 | | | | | | |
| Scup | | | | | 100 | 2 | | |
| Shad | | | | | 300 | 4 | | |
| Smelt | 29,800 | 2,500 | 134,900 | $11,350 | | | | |
| Sturgeon | | | | | 200 | 14 | | |
| Tomcod | | | 5,000 | 150 | | | | |
| Whiting | | | | | 624,900 | 5,300 | | |
| Wolffish | | | | | 9,000 | 70 | | |
| Shrimp | | | | | 82,500 | 5,691 | | |
| Scallops, sea | | | | | 400 | 63 | | |
| Sea urchins | 97,500 | 455 | | | | | | |
| Total | 2,058,500 | 10,611 | 139,900 | 11,500 | 5,337,700 | 103,654 | 45,000 | 4,370 |

## *Fisheries of Maine, 1938*—Continued

### CATCH: By gear—Continued

| Species | Pots | | | | | | Harpoons | |
|---|---|---|---|---|---|---|---|---|
| | Crab | | Eel | | Lobster | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels, common | | | 37,000 | $2,135 | | | | |
| Sharks | | | | | | | 200 | $4 |
| Swordfish | | | | | | | 59,400 | 10,314 |
| Tuna | | | | | | | 171,500 | 4,843 |
| Crabs, hard | 93,300 | $2,100 | | | 430,000 | $12,068 | | |
| Lobsters | | | | | 7,659,200 | 1,310,013 | | |
| Total | 93,300 | 2,100 | 37,000 | 2,135 | 8,089,200 | 1,322,081 | 231,100 | 15,161 |

| Species | Spears | | Dredges | | Rakes | | Hoes | | By hand | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels, common | 2,700 | $243 | | | | | | | | |
| Clams: | | | | | | | | | | |
| Hard, public | | | | | | | 55,000 | $4,000 | | |
| Soft, public | | | | | | | 7,134,300 | 317,951 | | |
| Mussels, sea | | | | | 7,200 | $175 | | | | |
| Periwinkles and cockles | | | | | | | | | 1,800 | $150 |
| Scallops, sea | | | 792,500 | $86,414 | | | | | | |
| Bloodworms | | | | | | | 116,400 | 34,884 | | |
| Sandworms | | | | | | | 58,800 | 17,627 | | |
| Total | 2,700 | 243 | 792,500 | 86,414 | 7,200 | 175 | 7,364,500 | 374,462 | 1,800 | 150 |

### OPERATING UNITS: By counties

| Item | Cumberland | Hancock | Kennebec | Knox | Lincoln | Penobscot | Sagadahoc | Waldo | Washington | York |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | | |
| On vessels | 238 | 39 | | 101 | 67 | | | | 24 | 15 |
| On boats and shore: | | | | | | | | | | |
| Regular | 287 | 514 | | 444 | 283 | | 81 | 35 | 488 | 262 |
| Casual | 381 | 1,014 | 14 | 314 | 462 | 26 | 262 | 76 | 803 | 128 |
| Total | 906 | 1,567 | 14 | 859 | 812 | 26 | 343 | 111 | 1,315 | 405 |
| Vessels, motor | 43 | 13 | | 40 | 17 | | | | 6 | 3 |
| Net tonnage | 521 | 116 | | 320 | 150 | | | | 45 | 23 |
| Boats: | | | | | | | | | | |
| Motor | 296 | 444 | | 430 | 244 | | 56 | 7 | 301 | 169 |
| Other | 238 | 398 | 5 | 204 | 238 | 18 | 73 | 56 | 588 | 112 |
| Accessory boats | 90 | 15 | | 24 | 22 | | | | 20 | 3 |
| Apparatus: | | | | | | | | | | |
| Purse seines: | | | | | | | | | | |
| Mackerel | 2 | 1 | | 2 | 5 | | | | | |
| Length, yards | 550 | 250 | | 370 | 1,900 | | | | | |
| Other | 2 | 2 | | 1 | 6 | | | | 1 | 3 |
| Length, yards | 600 | 400 | | 140 | 1,830 | | | | 270 | 820 |
| Haul seines, common | 30 | 1 | | 1 | 4 | | | | | |
| Length, yards | 3,000 | 30 | | 100 | 520 | | | | | |
| Stop seines | 13 | 11 | | 4 | 12 | | 1 | | 12 | |
| Length, yards | 11,250 | 6,950 | | 2,970 | 8,780 | | 500 | | 8,980 | |
| Gill nets: | | | | | | | | | | |
| Anchor | 514 | 27 | | | 271 | | | | 202 | |
| Square yards | 232,378 | 1,798 | | | 60,640 | | | | 23,300 | |
| Drift | 303 | | | 16 | | | | | | 211 |
| Square yards | 85,165 | | | 3,280 | | | | | | 53,920 |
| Stake | | | | | 6 | 72 | | 19 | | |
| Square yards | | | | | 258 | 5,940 | | 1,140 | | |
| Lines: | | | | | | | | | | |
| Hand | 69 | 2,135 | 54 | 65 | 1,017 | | 1,263 | | 136 | 2 |
| Hooks | 134 | 2,209 | 108 | 130 | 1,029 | | 1,268 | | 258 | 4 |
| Trawl | 5,304 | 3,487 | | 1,690 | 1,415 | | 690 | | 2,198 | 200 |
| Hooks | 279,000 | 206,350 | | 88,500 | 73,150 | | 62,750 | | 112,750 | 10,000 |
| Floating traps | 4 | 1 | | | 4 | | 7 | 1 | | |
| Weirs | | 108 | | 22 | 2 | | | 16 | 99 | |

## *Fisheries of Maine, 1938*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Cumberland | Hancock | Kennebec | Knox | Lincoln | Penobscot | Sagadahoc | Waldo | Washington | York |
|---|---|---|---|---|---|---|---|---|---|---|
| Apparatus—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fyke nets | | | 27 | | | | | | | |
| Dip nets | | 5 | | 15 | 18 | | 2 | | 24 | 1 |
| Bag nets | | 2 | | | | | | 50 | 55 | |
| Otter trawl, fish | 22 | 19 | | 12 | 5 | | | | 1 | 1 |
| Yards at mouth | 505 | 480 | | 293 | 115 | | | | 13 | 13 |
| Box traps | | 2 | | 3 | | | | | 9 | |
| Pots: | | | | | | | | | | |
| Crab | 200 | | | | | | | | | |
| Eel | | | | | 60 | | | 60 | 53 | |
| Lobster | 22,175 | 38,152 | | 41,315 | 22,615 | | 5,240 | 810 | 26,315 | 13,925 |
| Harpoons | 41 | | | | 9 | | 12 | | | |
| Spears | | | | 3 | 2 | | | | | |
| Dredges: | | | | | | | | | | |
| Oyster | 1 | | | | | | | | | |
| Yards at mouth | 2 | | | | | | | | | |
| Scallop | 18 | 96 | | 16 | | | | | 10 | |
| Yards at mouth | 26 | 98 | | 32 | | | | | 10 | |
| Rakes, other than for oysters | 3 | | | | | | | | | |
| Hoes | 285 | 541 | | 120 | 217 | | 30 | 32 | 771 | 150 |

### CATCH: BY COUNTIES

| Species | Cumberland | | Hancock | | Kennebec | | Knox | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 20,600 | $186 | 556,400 | $2,669 | | | 413,900 | $1,006 |
| Butterfish | 4,800 | 266 | | | | | | |
| Cod | 3,111,800 | 70,056 | 848,700 | 12,056 | | | 670,600 | 11,490 |
| Cunners | 28,000 | 542 | 17,300 | 260 | | | | |
| Cusk | 1,058,900 | 20,778 | 14,800 | 168 | | | 54,300 | 818 |
| Eels, common | | | 800 | 80 | 300 | $23 | 1,500 | 131 |
| Flounders: | | | | | | | | |
| Gray sole | 400,700 | 12,914 | 166,200 | 4,116 | | | 90,200 | 2,603 |
| Lemon sole | 7,500 | 164 | 200 | 5 | | | | |
| Yellowtail and dab | 175,500 | 2,158 | 33,100 | 437 | | | 80,300 | 1,436 |
| Blackback | 38,500 | 801 | 428,600 | 12,811 | | | 95,900 | 1,917 |
| Unclassified | 25,900 | 840 | 10,000 | 200 | | | 200 | 5 |
| Haddock | 1,279,300 | 40,451 | 201,900 | 6,118 | | | 600,900 | 17,165 |
| Hake | 3,664,000 | 45,507 | 2,185,500 | 13,553 | | | 1,509,200 | 10,858 |
| Halibut | 11,100 | 1,608 | 8,200 | 1,215 | | | 6,500 | 923 |
| Herring, sea | 4,449,900 | 40,418 | 2,149,300 | 18,310 | | | 998,400 | 9,833 |
| Mackerel | 438,500 | 12,757 | 264,500 | 3,135 | | | 146,100 | 1,742 |
| Pollock | 3,893,500 | 33,275 | 720,300 | 5,370 | | | 484,700 | 3,467 |
| Rosefish | 219,500 | 2,395 | 231,100 | 2,545 | | | 3,600 | 45 |
| Salmon | 600 | 149 | 5,200 | 2,098 | | | | |
| Shad | 10,700 | 406 | | | | | 300 | 9 |
| Sharks | 21,700 | 320 | | | | | 600 | 12 |
| Smelt | 182,200 | 13,477 | 166,300 | 13,670 | 6,000 | 600 | 52,000 | 4,238 |
| Sturgeon | 500 | 28 | | | | | | |
| Suckers | | | | | 30,500 | 762 | | |
| Swordfish | 59,500 | 10,326 | | | | | | |
| Tomcod | | | | | 2,700 | 54 | | |
| Tuna | 91,400 | 2,387 | | | | | | |
| Whiting | 400,200 | 3,179 | | | | | 300 | 3 |
| Wolffish | 27,800 | 212 | 1,500 | 20 | | | 12,200 | 195 |
| Yellow perch | | | | | 300 | 26 | | |
| Crabs, hard | 422,800 | 11,448 | | | | | 28,000 | 620 |
| Lobsters | 1,070,800 | 181,672 | 1,591,200 | 277,088 | | | 1,999,500 | 333,843 |
| Shrimp | 67,600 | 4,467 | | | | | | |
| Clams: | | | | | | | | |
| Hard, public | 55,000 | 4,000 | | | | | | |
| Soft, public | 614,400 | 32,392 | 489,900 | 29,173 | | | 743,400 | 23,120 |
| Mussels, sea | 7,200 | 175 | | | | | | |
| Scallops, sea | 25,400 | 3,709 | 316,500 | 36,005 | | | 445,200 | 45,950 |
| Squid | 5,200 | 52 | | | | | | |
| Bloodworms | 58,100 | 17,407 | | | | | 2,000 | 608 |
| Sandworms | 500 | 150 | | | | | 2,000 | 608 |
| Total | 21,952,600 | 571,072 | 10,407,500 | 441,102 | 39,800 | 1,465 | 8,441,800 | 472,645 |

## *Fisheries of Maine, 1938*—Continued

### CATCH: BY COUNTIES—Continued

| Species | Lincoln | | Penobscot | | Sagadahoc | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 1,052,200 | $3,454 | | | 90,000 | $500 |
| Butterfish | 100 | 4 | | | 11,500 | 640 |
| Cod | 555,200 | 14,928 | | | 201,100 | 3,730 |
| Cusk | 261,400 | 3,645 | | | 103,600 | 2,062 |
| Eels, common | 3,200 | 288 | | | | |
| Flounders: | | | | | | |
| Gray sole | 104,300 | 3,151 | | | 1,800 | 51 |
| Lemon sole | 5,500 | 96 | | | | |
| Yellowtail and dab | 107,700 | 1,810 | | | 900 | 11 |
| Blackback | 19,200 | 414 | | | | |
| Unclassified | 5,600 | 134 | | | | |
| Haddock | 137,100 | 4,177 | | | 85,500 | 3,092 |
| Hake | 721,000 | 6,930 | | | 371,900 | 4,355 |
| Halibut | 1,000 | 137 | | | 900 | 141 |
| Herring, sea | 4,009,800 | 50,175 | | | 66,000 | 1,100 |
| Mackerel | 687,800 | 16,554 | | | 295,000 | 7,600 |
| Pollock | 602,400 | 4,840 | | | 10,300 | 85 |
| Rosefish | 114,800 | 1,285 | | | 600 | 6 |
| Salmon | 1,000 | 200 | | | 3,300 | 815 |
| Scup | 100 | 2 | | | | |
| Shad | 900 | 97 | | | | |
| Sharks | 600 | 7 | | | | |
| Smelt | 48,500 | 3,555 | 14,500 | $1,015 | 51,000 | 5,900 |
| Tuna | 25,000 | 800 | | | 65,200 | 1,959 |
| Whiting | 247,000 | 2,310 | | | | |
| Wolffish | 600 | 4 | | | 5,500 | 41 |
| Crabs, hard | 62,500 | 1,875 | | | 10,000 | 225 |
| Lobsters | 1,055,400 | 170,506 | | | 245,600 | 43,302 |
| Shrimp | 14,900 | 1,224 | | | | |
| Clams, soft, public | 413,900 | 13,448 | | | 189,000 | 8,640 |
| Scallops, sea | 400 | 63 | | | | |
| Sea urchins | 97,500 | 455 | | | | |
| Bloodworms | 56,300 | 16,869 | | | | |
| Sandworms | 56,300 | 16,869 | | | | |
| Total | 10,469,200 | 340,306 | 14,500 | 1,015 | 1,808,700 | 84,255 |

| Species | Waldo | | Washington | | York | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 887,000 | $3,745 | 120,000 | $600 |
| Butterfish | | | | | 1,400 | 66 |
| Cod | | | 819,500 | 12,268 | 13,700 | 267 |
| Cusk | | | 8,500 | 78 | 4,400 | 89 |
| Eels, common | 30,000 | $1,500 | 49,200 | 4,749 | | |
| Flounders: | | | | | | |
| Yellowtail and dab | | | | | 100 | 1 |
| Blackback | | | 3,000 | 50 | 5,000 | 500 |
| Unclassified | | | 9,000 | 235 | | |
| Haddock | | | 191,900 | 5,586 | 11,900 | 385 |
| Hake | | | 584,100 | 3,571 | 12,300 | 209 |
| Halibut | | | 11,600 | 1,557 | 100 | 14 |
| Herring, sea | 81,000 | 675 | 4,300,600 | 34,257 | | |
| Mackerel | 25,400 | 212 | 8,200 | 104 | 115,400 | 3,331 |
| Pollock | | | 174,100 | 1,552 | 34,600 | 254 |
| Salmon | 5,400 | 1,428 | 200 | 30 | | |
| Smelt | 71,000 | 4,980 | 100,500 | 10,767 | 800 | 100 |
| Tomcod | 5,000 | 150 | | | | |
| Lobsters | 24,900 | 5,035 | 874,900 | 147,312 | 796,900 | 151,255 |
| Clams, soft, public | 54,000 | 7,000 | 3,128,700 | 104,888 | 1,501,000 | 99,290 |
| Periwinkles and cockles | | | 1,800 | 150 | | |
| Scallops, sea | | | 5,400 | 750 | | |
| Total | 296,700 | 20,980 | 11,158,200 | 331,649 | 2,617,600 | 256,361 |

## NEW HAMPSHIRE

### *Fisheries of New Hampshire, 1938* [1]

OPERATING UNITS: BY GEAR

| Item | Lines |  | Bag nets | Pots, lobster | Hoes | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
|  | Hand | Trawl |  |  |  |  |
| Fishermen, on boats and shore: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Regular | -------- | 1 | -------- | 35 | 95 | 120 |
| Casual | 125 | 1 | 20 | 49 | 10 | 187 |
| Total | 125 | 2 | 20 | 84 | 105 | 307 |
| Boats: |  |  |  |  |  |  |
| Motor | -------- | 2 | -------- | 38 | -------- | 38 |
| Other | -------- | -------- | -------- | 35 | 36 | 68 |
| Apparatus: |  |  |  |  |  |  |
| Number | 750 | 50 | 31 | 3,740 | 105 | -------- |
| Hooks | 750 | 2,500 | -------- | -------- | -------- | -------- |

CATCH: BY GEAR

| Species | Lines |  |  |  | Bag nets |  | Pots |  | Hoes |  |
|---|---|---|---|---|---|---|---|---|---|---|
|  | Hand |  | Trawl |  |  |  |  |  |  |  |
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod | -------- | -------- | 1,500 | $45 | -------- | -------- | -------- | -------- | -------- | -------- |
| Cusk | -------- | -------- | 1,000 | 28 | -------- | -------- | -------- | -------- | -------- | -------- |
| Haddock | -------- | -------- | 2,000 | 80 | -------- | -------- | -------- | -------- | -------- | -------- |
| Hake | -------- | -------- | 3,000 | 60 | -------- | -------- | -------- | -------- | -------- | -------- |
| Smelt | 40,000 | $3,600 | -------- | -------- | 8,000 | $750 | -------- | -------- | -------- | -------- |
| Lobsters | -------- | -------- | -------- | -------- | -------- | -------- | 170,200 | $37,272 | -------- | -------- |
| Clams, soft, public | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 570,000 | $67,300 |
| Total | 40,000 | 3,600 | 7,500 | 213 | 8,000 | 750 | 170,200 | 37,272 | 570,000 | 67,300 |

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[1] The commercial fisheries of New Hampshire are confined to Rockingham County.

## MASSACHUSETTS

### *Fisheries of Massachusetts, 1938*

OPERATING UNITS: BY GEAR

| Item | Purse seines |  | Haul seines, common | Gill nets |  | Lines |  | Pound nets |
|---|---|---|---|---|---|---|---|---|
|  | Mackerel | Other |  | Anchor | Drift | Hand | Trawl |  |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 642 | 39 | -------- | 211 | 227 | 35 | 675 | -------- |
| On boats and shore: |  |  |  |  |  |  |  |  |
| Regular | 53 | -------- | 13 | 64 | 72 | 162 | 572 | 211 |
| Casual | 1 | -------- | 7 | 5 | 8 | 258 | 8 | 3 |
| Total | 696 | 39 | 20 | 280 | 307 | 455 | 1,255 | 214 |
| Vessels, motor | 59 | 4 | -------- | 28 | 30 | 8 | 51 | -------- |
| Net tonnage | 2,142 | 140 | -------- | 686 | 538 | 120 | 1,878 | -------- |
| Boats: |  |  |  |  |  |  |  |  |
| Motor | 9 | -------- | 2 | 28 | 30 | 156 | 185 | 51 |
| Other | 7 | -------- | 4 | 4 | -------- | 60 | 24 | 92 |
| Accessory boats | 57 | 1 | -------- | -------- | 1 | -------- | 316 | -------- |
| Apparatus: |  |  |  |  |  |  |  |  |
| Number | 68 | 4 | 9 | 1,768 | 3,369 | 536 | 29,064 | 128 |
| Length, yards | 32,248 | 2,110 | 409 | -------- | -------- | -------- | -------- | -------- |
| Square yards | -------- | -------- | -------- | 578,055 | 1,159,753 | -------- | -------- | -------- |
| Hooks, baits, or snoods | -------- | -------- | -------- | -------- | -------- | 1,101 | 1,824,640 | -------- |

## *Fisheries of Massachusetts, 1938*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Floating traps | Weirs | Fyke nets | Dip nets | Push nets | Otter trawl, fish | Pots | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Crab | Eel |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | | | | 5 | | 2, 780 | | |
| On boats and shore: | | | | | | | | |
| Regular | 79 | 4 | 18 | 126 | 45 | 187 | 55 | 18 |
| Casual | | | 9 | 107 | 72 | 1 | 33 | 20 |
| Total | 79 | 4 | 27 | 238 | 117 | 2, 968 | 88 | 38 |
| Vessels: | | | | | | | | |
| Steam | | | | | | 14 | | |
| Net tonnage | | | | | | 2, 589 | | |
| Motor | | | | 1 | | 278 | | |
| Net tonnage | | | | 8 | | 12, 659 | | |
| Total vessels | | | | 1 | | 292 | | |
| Total net tonnage | | | | 8 | | 15, 248 | | |
| Boats: | | | | | | | | |
| Motor | 35 | | | 80 | | 59 | 69 | 14 |
| Other | 21 | | 9 | 52 | 71 | | | 14 |
| Apparatus: | | | | | | | | |
| Number | 57 | 2 | 26 | 189 | 84 | 351 | 5, 634 | 775 |
| Yards at mouth | | | | | | 10, 453 | | |

| Item | Pots—Continued | | Harpoons | Spears | Dredges | | |
|---|---|---|---|---|---|---|---|
| | Lobster | Periwinkle and cockle | | | Clam | Oyster | Scallop |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | 601 | | 10 | | 265 |
| On boats and shore: | | | | | | | |
| Regular | 1, 010 | 5 | 111 | 38 | 107 | 41 | 705 |
| Casual | 114 | 4 | 9 | | 18 | 4 | 720 |
| Total | 1, 124 | 9 | 721 | 38 | 135 | 45 | 1, 690 |
| Vessels, motor | | | 64 | | 3 | | 36 |
| Net tonnage | | | 1, 889 | | 40 | | 828 |
| Boats: | | | | | | | |
| Motor | 914 | 1 | 35 | | 63 | 22 | 518 |
| Other | 53 | 3 | 1 | | | | 336 |
| Accessory boats | | | 59 | | | | |
| Apparatus: | | | | | | | |
| Number | 78, 886 | 104 | 99 | 38 | 90 | 43 | 2, 496 |
| Yards at mouth | | | | | 43 | 44 | 2, 327 |

| Item | Tongs | | Rakes, other than for oysters | Forks | Hoes | By hand, other than for oysters | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|
| | Oyster | Other | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | | | | 4, 109 |
| On boats and shore: | | | | | | | |
| Regular | 30 | 49 | 455 | 120 | 714 | 2 | 3, 842 |
| Casual | 13 | 81 | 675 | 459 | 885 | 89 | 3, 051 |
| Total | 43 | 130 | 1, 130 | 579 | 1, 599 | 91 | 11, 002 |
| Vessels: | | | | | | | |
| Steam | | | | | | | 14 |
| Net tonnage | | | | | | | 2, 589 |
| Motor | | | | | | | 395 |
| Net tonnage | | | | | | | 16, 205 |
| Total vessels | | | | | | | 409 |
| Total net tonnage | | | | | | | 18, 794 |
| Boats: | | | | | | | |
| Motor | 2 | 25 | 67 | 1 | 16 | | 1, 920 |
| Other | 37 | 77 | 572 | 37 | 228 | 2 | 1, 487 |
| Accessory boats | | | | | | | 417 |
| Apparatus, number | 43 | 128 | 1, 130 | 579 | 1, 599 | | |

## *Fisheries of Massachusetts, 1938*—Continued

### CATCH: BY GEAR

| Species | Purse seines | | | | Haul seines | | Gill nets | |
|---|---|---|---|---|---|---|---|---|
| | Mackerel | | Other | | | | Anchor | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 72,000 | $520 | 76,500 | $571 | 246,000 | $1,270 | ------ | ------ |
| Butterfish | 160,300 | 5,341 | ------ | ------ | ------ | ------ | 800 | $23 |
| Cod | 200 | 3 | ------ | ------ | ------ | ------ | 2,191,000 | 53,274 |
| Cusk | ------ | ------ | ------ | ------ | ------ | ------ | 4,000 | 45 |
| Eels, common | ------ | ------ | ------ | ------ | 220,900 | 2,827 | ------ | ------ |
| Flounders: | | | | | | | | |
| Gray sole | 900 | 15 | ------ | ------ | ------ | ------ | 100 | 7 |
| Yellowtail and dab | 37,600 | 544 | ------ | ------ | ------ | ------ | 29,300 | 379 |
| Blackback | 200 | 4 | ------ | ------ | 1,000 | 20 | 4,100 | 106 |
| Fluke | 100 | 6 | ------ | ------ | ------ | ------ | ------ | ------ |
| Unclassified | ------ | ------ | ------ | ------ | ------ | ------ | 100 | 1 |
| Haddock | 700 | 12 | ------ | ------ | ------ | ------ | 698,000 | 16,909 |
| Hake | 100 | 1 | ------ | ------ | ------ | ------ | 1,198,400 | 14,126 |
| Halibut | 300 | 40 | ------ | ------ | ------ | ------ | 600 | 78 |
| Herring, sea | ------ | ------ | 100,000 | 700 | ------ | ------ | 1,700 | 11 |
| Mackerel | 28,858,500 | 854,270 | ------ | ------ | ------ | ------ | 227,800 | 6,917 |
| Pollock | 2,800 | 14 | ------ | ------ | ------ | ------ | 8,532,500 | 82,075 |
| Rosefish | ------ | ------ | ------ | ------ | ------ | ------ | 14,100 | 211 |
| Scup | 600 | 36 | ------ | ------ | ------ | ------ | ------ | ------ |
| Shad | 900 | 22 | 3,700 | 48 | 3,000 | 56 | 20,300 | 1,119 |
| Sharks | 6,000 | 250 | ------ | ------ | ------ | ------ | 16,000 | 433 |
| Skates | ------ | ------ | ------ | ------ | ------ | ------ | 200 | 3 |
| Sturgeon | ------ | ------ | 200 | 47 | ------ | ------ | 800 | 57 |
| Tuna | 7,900 | 311 | 969,900 | 36,270 | ------ | ------ | ------ | ------ |
| Whiting | ------ | ------ | ------ | ------ | ------ | ------ | 300 | 3 |
| Wolffish | ------ | ------ | ------ | ------ | ------ | ------ | 900 | 25 |
| Total | 29,149,100 | 861,389 | 1,150,300 | 37,636 | 470,900 | 4,173 | 12,941,000 | 175,802 |

| Species | Gill nets—Con. | | Lines | | | | Pound nets | |
|---|---|---|---|---|---|---|---|---|
| | Drift | | Hand | | Trawl | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 2,500 | $19 | ------ | ------ | ------ | ------ | 2,000 | $9 |
| Bluefish | 2,600 | 297 | 40,100 | $3,187 | 2,000 | $300 | 4,300 | 440 |
| Bonito | ------ | ------ | ------ | ------ | ------ | ------ | 5,000 | 344 |
| Butterfish | 7,400 | 323 | ------ | ------ | 200 | 5 | 348,500 | 14,889 |
| Cod | 100 | 2 | 174,300 | 4,173 | 14,589,300 | 334,849 | 21,900 | 424 |
| Cusk | ------ | ------ | ------ | ------ | 4,723,600 | 81,630 | ------ | ------ |
| Eels: | | | | | | | | |
| Common | ------ | ------ | ------ | ------ | ------ | ------ | 300 | 33 |
| Conger | ------ | ------ | ------ | ------ | 1,000 | 8 | 1,900 | 34 |
| Flounders: | | | | | | | | |
| Gray sole | ------ | ------ | ------ | ------ | 2,300 | 141 | ------ | ------ |
| Lemon sole | ------ | ------ | ------ | ------ | 47,000 | 3,862 | ------ | ------ |
| Yellowtail and dab | ------ | ------ | 100 | 2 | 166,600 | 5,482 | 100 | 2 |
| Blackback | ------ | ------ | 600 | 24 | 189,000 | 6,981 | 16,100 | 161 |
| Fluke | ------ | ------ | ------ | ------ | ------ | ------ | 11,400 | 552 |
| Unclassified | ------ | ------ | ------ | ------ | ------ | ------ | 100 | 7 |
| Grayfish | ------ | ------ | ------ | ------ | ------ | ------ | 42,400 | 1,065 |
| Haddock | ------ | ------ | 20,900 | 567 | 15,574,100 | 450,950 | ------ | ------ |
| Hake | 1,200 | 18 | 5,000 | 91 | 6,132,200 | 112,113 | ------ | ------ |
| Halibut | ------ | ------ | ------ | ------ | 1,256,200 | 131,132 | ------ | ------ |
| Herring, sea | 600 | 4 | ------ | ------ | ------ | ------ | 2,618,900 | 14,199 |
| Mackerel | 780,900 | 41,354 | 8,800 | 338 | 1,600 | 13 | 5,906,100 | 172,127 |
| Menhaden | ------ | ------ | ------ | ------ | ------ | ------ | 36,500 | 296 |
| Pollock | 100 | 2 | 199,200 | 1,863 | 1,057,100 | 15,940 | 883,700 | 7,925 |
| Rosefish | ------ | ------ | ------ | ------ | 3,100 | 40 | ------ | ------ |
| Salmon | ------ | ------ | ------ | ------ | ------ | ------ | 100 | 11 |
| Scup | 100 | 3 | 28,800 | 856 | ------ | ------ | 131,500 | 1,461 |
| Sea bass | ------ | ------ | 8,300 | 616 | ------ | ------ | 7,700 | 747 |
| Sea robin | ------ | ------ | ------ | ------ | ------ | ------ | 400 | 8 |
| Shad | 300 | 8 | ------ | ------ | ------ | ------ | 25,500 | 884 |
| Sharks | 12,200 | 398 | 1,200 | 60 | 500 | 13 | 40,300 | 1,353 |
| Skates | ------ | ------ | ------ | ------ | 200 | 4 | 400 | 4 |
| Skipper or "billfish" | ------ | ------ | ------ | ------ | ------ | ------ | 800 | 116 |
| Smelt | ------ | ------ | 22,200 | 4,970 | ------ | ------ | ------ | ------ |
| Squeteagues or "sea trout," gray | ------ | ------ | ------ | ------ | ------ | ------ | 180,500 | 1,863 |
| Striped bass | ------ | ------ | 33,800 | 2,993 | 600 | 126 | 18,200 | 2,115 |
| Sturgeon | ------ | ------ | ------ | ------ | ------ | ------ | 2,300 | 196 |
| Swordfish | 1,400 | 205 | ------ | ------ | 1,000 | 224 | ------ | ------ |

## *Fisheries of Massachusette, 1938*—Continued

### CATCH: BY GEAR—Continued

| Species | Gill nets—Con. | | Lines | | | | Pound nets | |
|---|---|---|---|---|---|---|---|---|
| | Drift | | Hand | | Trawl | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Tautog | | | 15,000 | $732 | | | 21,400 | $755 |
| Tilefish | | | | | 366,600 | $14,430 | | |
| Tomcod | | | | | | | 11,000 | 578 |
| Tuna | | | 3,500 | 140 | | | 306,500 | 11,227 |
| Whiting | 500 | $6 | | | 53,500 | 471 | 10,090,700 | 85,522 |
| Wolffish | | | 100 | 2 | 316,700 | 6,382 | | |
| Squid | 100 | 3 | | | | | 993,900 | 10,182 |
| Total | 810,000 | 42,642 | 561,900 | 20,614 | 44,484,400 | 1,165,096 | 21,730,400 | 329,529 |

| Species | Floating traps | | Weirs | | Fyke nets | | Dip nets | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 56,000 | $615 | 123,800 | $1,091 | | | 320,200 | $1,599 |
| Bluefish | 100 | 11 | | | | | | |
| Butterfish | 55,400 | 2,648 | | | | | | |
| Cod | 72,300 | 1,338 | | | | | | |
| Eels, common | | | | | 12,200 | $1,741 | | |
| Flounders: | | | | | | | | |
| Blackback | 16,100 | 160 | | | 1,800 | 72 | | |
| Fluke | 200 | 9 | | | | | | |
| Hake | 14,300 | 61 | | | | | | |
| Herring, sea | 352,500 | 2,577 | | | | | 1,799,600 | 18,470 |
| Mackerel | 988,500 | 26,182 | | | 2,000 | 80 | | |
| Menhaden | 2,600 | 26 | | | | | | |
| Pollock | 266,200 | 2,280 | | | | | | |
| Salmon | 400 | 81 | | | | | | |
| Scup | 100 | 3 | | | | | | |
| Sea bass | 400 | 44 | | | | | | |
| Shad | 500 | 10 | | | | | | |
| Squeteagues or "sea trout," gray | 17,700 | 190 | | | | | | |
| Striped bass | 15,200 | 1,552 | | | 13,800 | 1,800 | | |
| Sturgeon | 1,600 | 186 | | | | | | |
| Tautog | 100 | 4 | | | | | | |
| Tuna | 21,900 | 773 | | | | | | |
| Whiting | 1,856,200 | 13,114 | | | | | | |
| Scallops, bay | | | | | | | 46,700 | 16,250 |
| Squid | 52,700 | 1,063 | | | | | | |
| Total | 3,791,000 | 52,927 | 123,800 | 1,091 | 29,800 | 3,693 | 2,166,500 | 36,319 |

| Species | Push nets | | Otter trawls | | Pots | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Crab | | Eel | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 58,800 | $654 | | | | |
| Bluefish | | | 22,000 | 1,457 | | | | |
| Bonito | | | 1,100 | 55 | | | | |
| Butterfish | | | 653,200 | 23,689 | | | | |
| Cod | | | 94,266,100 | 1,666,527 | | | | |
| Croaker | | | 1,729,100 | 31,927 | | | | |
| Cusk | | | 1,310,200 | 20,896 | | | | |
| Drum, red | | | 1,600 | 25 | | | | |
| Eels: | | | | | | | | |
| Common | | | | | | | 42,200 | $4,728 |
| Conger | | | 111,800 | 2,238 | | | | |
| Flounders: | | | | | | | | |
| Gray sole | | | 7,433,400 | 291,225 | | | | |
| Lemon sole | | | 3,266,600 | 210,151 | | | | |
| Yellowtail and dab | | | 17,213,400 | 367,376 | | | | |
| Blackback | | | 8,516,900 | 298,083 | | | | |
| Fluke | | | 1,942,900 | 141,395 | | | | |
| Unclassified | | | 603,700 | 20,883 | | | | |
| Goosefish | | | 400 | 7 | | | | |
| Haddock | | | 139,130,800 | 2,907,327 | | | | |
| Hake | | | 7,412,900 | 109,401 | | | | |
| Halibut | | | 675,500 | 69,358 | | | | |
| Herring, sea | | | 7,400 | 104 | | | | |

## *Fisheries of Massachusetts, 1938*—Continued

CATCH: BY GEAR—Continued

| Species | Push nets | | Otter trawls | | Pots | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Crab | | Eel | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Herring smelt | | | 500 | $10 | | | | |
| King whiting or "kingfish" | | | 5, 200 | 107 | | | | |
| Mackerel | | | 58, 700 | 1, 992 | | | | |
| Pollock | | | 23, 279, 200 | 287, 560 | | | | |
| Rosefish | | | 64, 418, 500 | 796, 897 | | | | |
| Scup | | | 9, 655, 500 | 249, 901 | | | | |
| Sea bass | | | 3, 586, 900 | 142, 650 | | | | |
| Sea robin | | | 80, 100 | 1, 280 | | | | |
| Shad | | | 300 | 24 | | | | |
| Sharks | | | 46, 900 | 833 | | | | |
| Skates | | | 65, 400 | 983 | | | | |
| Smelt | | | 3, 700 | 131 | | | | |
| Spot | | | 8, 200 | 163 | | | | |
| Squeteagues or "sea trout," gray | | | 73, 500 | 3, 997 | | | | |
| Sturgeon | | | 3, 600 | 311 | | | | |
| Swordfish | | | 1, 900 | 317 | | | | |
| Tautog | | | 1, 000 | 56 | | | | |
| Tilefish | | | 400 | 15 | | | | |
| Tuna | | | 18, 500 | 766 | | | | |
| Whiting | | | 12, 202, 200 | 166, 496 | | | | |
| Wolffish | | | 2, 246, 300 | 41, 402 | | | | |
| Yellow perch | | | 18, 300 | 501 | | | | |
| Crabs, hard | | | | | 1, 178, 100 | $27, 473 | | |
| Lobsters | | | 10, 400 | 1, 818 | | | | |
| Shrimp | | | 23, 200 | 1, 930 | | | | |
| Scallops: | | | | | | | | |
| Bay | 49, 100 | $14, 624 | | | | | | |
| Sea | | | 9, 900 | 1, 049 | | | | |
| Squid | | | 298, 100 | 4, 977 | | | | |
| Total | 49, 100 | 14, 624 | 400, 474, 200 | 7, 868, 944 | 1, 178, 100 | 27, 473 | 42, 200 | $4, 728 |

| Species | Pots—Continued | | | | Harpoons | | Spears | |
|---|---|---|---|---|---|---|---|---|
| | Lobster | | Periwinkles and cockles | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels, common | | | | | | | 8, 800 | $839 |
| Swordfish | | | | | 1, 821, 800 | $306, 798 | | |
| Tuna | | | | | 36, 700 | 1, 439 | | |
| Crabs, hard | 114, 500 | $3, 269 | | | | | | |
| Lobsters | 2, 304, 700 | 497, 592 | | | | | | |
| Periwinkles and cockles | | | 9, 600 | $747 | | | | |
| Total | 2, 419, 200 | 500, 861 | 9, 600 | 747 | 1, 858, 500 | 308, 237 | 8, 800 | 839 |

| Species | Dredges | | Tongs | | Rakes | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams: | | | | | | |
| Hard, public | 445, 400 | $45, 923 | 106, 500 | $12, 462 | 1, 573, 900 | $186, 670 |
| Hard, private | | | | | 4, 200 | 518 |
| Soft, public | 26, 000 | 2, 344 | | | | |
| Surf or skimmer | | | | | 1, 300 | 76 |
| Oysters, market: | | | | | | |
| Public, spring | | | 6, 100 | 1, 150 | 1, 800 | 280 |
| Private, spring | 78, 000 | 26, 051 | 141, 800 | 52, 264 | | |
| Scallops: | | | | | | |
| Bay | 885, 300 | 281, 388 | | | 114, 200 | 40, 967 |
| Sea | 5, 047, 300 | 534, 357 | | | | |
| Total | 6, 482, 000 | 890, 063 | 254, 400 | 65, 876 | 1, 695, 400 | 228, 511 |

## *Fisheries of Massachusetts, 1938*—Continued

### CATCH: BY GEAR—Continued

| Species | Forks | | Hoes | | By hand | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams: | | | | | | |
| Hard, public | 400 | $40 | 168, 300 | $17, 561 | | |
| Razor | | | 512, 900 | 13, 859 | | |
| Soft, public | 285, 800 | 26, 191 | 4, 437, 900 | 408, 323 | | |
| Soft, private | | | 28, 000 | 2, 500 | | |
| Mussels, sea | | | | | 15, 700 | $441 |
| Irish moss | | | | | 177, 200 | 15, 714 |
| Kelp | | | | | 120, 000 | 720 |
| Bloodworms | 21, 900 | 5, 249 | 4, 400 | 1, 040 | | |
| Sandworms | 180, 500 | 31, 965 | 16, 900 | 3, 970 | | |
| Total | 488, 600 | 63, 445 | 5, 168, 400 | 447, 253 | 312, 900 | 16, 875 |

### OPERATING UNITS: BY COUNTIES

| Item | Barnstable | Bristol | Dukes | Essex | Nantucket | Norfolk | Plymouth | Suffolk |
|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | 120 | 262 | 63 | 1, 529 | 59 | | 5 | 2, 071 |
| On boats and shore: | | | | | | | | |
| Regular | 1, 063 | 288 | 302 | 1, 001 | 117 | 84 | 445 | 542 |
| Casual | 629 | 501 | 375 | 500 | 32 | 297 | 424 | 293 |
| Total | 1, 812 | 1, 051 | 740 | 3, 030 | 208 | 381 | 874 | 2, 906 |
| Vessels: | | | | | | | | |
| Steam | | | | 1 | | | | 13 |
| Net tonnage | | | | 184 | | | | 2, 405 |
| Motor | 28 | 43 | 11 | 140 | 14 | | 1 | 158 |
| Net tonnage | 332 | 739 | 201 | 5, 160 | 184 | | 21 | 9, 568 |
| Total vessels | 28 | 43 | 11 | 141 | 14 | | 1 | 171 |
| Total net tonnage | 332 | 739 | 201 | 5, 344 | 184 | | 21 | 11, 973 |
| Boats: | | | | | | | | |
| Motor | 515 | 228 | 150 | 470 | 81 | 61 | 266 | 149 |
| Other | 427 | 189 | 498 | 212 | 10 | 5 | 84 | 62 |
| Accessory boats | 5 | 11 | 5 | 278 | | | | 118 |
| Apparatus: | | | | | | | | |
| Purse seines: | | | | | | | | |
| Mackerel | 3 | 1 | | 44 | | | | 20 |
| Length, yards | 1, 200 | 540 | | 21, 358 | | | | 9, 150 |
| Other | | | | 4 | | | | |
| Length, yards | | | | 2, 110 | | | | |
| Hall seines, common | | | 1 | 7 | | | 1 | |
| Length, yards | | | 4 | 380 | | | 25 | |
| Gill nets: | | | | | | | | |
| Anchor | 300 | | | 1, 464 | | 4 | | |
| Square yards | 51, 200 | | | 526, 695 | | 160 | | |
| Drift | 158 | 212 | | 2, 043 | 36 | | 125 | 795 |
| Square yards | 61, 280 | 62, 541 | | 718, 354 | 10, 200 | | 50, 860 | 256, 518 |
| Lines: | | | | | | | | |
| Hand | 95 | 125 | 31 | 102 | 26 | 150 | 5 | 2 |
| Hooks | 127 | 250 | 62 | 446 | 52 | 150 | 10 | 4 |
| Trawl | 3, 340 | | | 12, 876 | 70 | | 200 | 12, 578 |
| Hooks | 166, 900 | | | 735, 840 | 2, 800 | | 100, 000 | 819, 100 |
| Pound nets | 118 | 2 | 6 | | | | 2 | |
| Floating traps | 4 | 1 | | 51 | | | 1 | |
| Weirs | | | | 1 | | | 1 | |
| Fyke nets | 25 | | 1 | | | | | |
| Dip nets | 126 | | 10 | 38 | | | 9 | 6 |
| Push nets | | | 84 | | | | | |
| Otter trawls, fish | 47 | 40 | 14 | 75 | 19 | | 6 | 150 |
| Yards at mouth | 1, 220 | 1, 088 | 408 | 2, 412 | 499 | | 175 | 4, 651 |
| Pots: | | | | | | | | |
| Crab | 37 | | | 1, 039 | | 376 | 355 | 3, 827 |
| Eel | 174 | 94 | 220 | 160 | 100 | | 27 | |
| Lobster | 9, 829 | 4, 813 | 7, 677 | 27, 127 | 875 | 3, 682 | 14, 430 | 10, 453 |
| Periwinkle and cockle | 27 | | | 50 | 18 | | 9 | |
| Harpoons | 12 | 16 | 17 | 43 | 1 | | | 10 |
| Spears | | 9 | 29 | | | | | |

## *Fisheries of Massachusetts, 1938*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Barnstable | Bristol | Dukes | Essex | Nantucket | Norfolk | Plymouth | Suffolk |
|---|---|---|---|---|---|---|---|---|
| Apparatus—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Dredges: | | | | | | | | |
| Clam | 25 | 50 | 5 | -------- | 8 | -------- | 2 | -------- |
| Yards at mouth | 11 | 25 | 3 | -------- | 2 | -------- | 2 | -------- |
| Oyster | 13 | -------- | -------- | -------- | -------- | -------- | 30 | -------- |
| Yards at mouth | 14 | -------- | -------- | -------- | -------- | -------- | 30 | -------- |
| Scallop | 774 | 586 | 844 | 10 | 212 | -------- | 66 | 4 |
| Yards at mouth | 661 | 639 | 746 | 35 | 177 | -------- | 55 | 14 |
| Tongs: | | | | | | | | |
| Oyster | 32 | 11 | -------- | -------- | -------- | -------- | -------- | -------- |
| Other | 6 | 56 | -------- | -------- | 2 | -------- | 64 | -------- |
| Rakes, other than for oysters | 554 | 309 | 173 | -------- | 20 | -------- | 74 | -------- |
| Forks | -------- | 21 | 4 | 114 | -------- | 98 | -------- | 342 |
| Hoes | 362 | 43 | 11 | 653 | 20 | 44 | 466 | -------- |

### CATCH: BY COUNTIES

| Species | Barnstable | | Bristol | | Dukes | | Essex | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 195, 100 | $1, 197 | -------- | -------- | 6, 000 | $50 | 269, 100 | $2, 353 |
| Bluefish | 11, 200 | 800 | 11, 600 | $714 | 6, 500 | 507 | 18, 100 | 1, 642 |
| Bonito | 2. 500 | 216 | -------- | -------- | 2, 500 | 128 | 1, 100 | 55 |
| Butterfish | 292, 400 | 12, 883 | 205, 500 | 7, 388 | 54, 400 | 1, 973 | 458, 100 | 16, 264 |
| Cod | 1, 823, 300 | 44, 113 | 991, 200 | 21, 361 | 22, 300 | 503 | 12, 928, 900 | 265, 239 |
| Croaker | -------- | -------- | 25, 500 | 520 | -------- | -------- | 1, 397, 500 | 25, 777 |
| Cusk | 16, 900 | 240 | 2, 400 | 20 | -------- | -------- | 3, 564, 500 | 60, 785 |
| Drum, red | -------- | -------- | -------- | -------- | -------- | -------- | 1, 600 | 25 |
| Eels: | | | | | | | | |
| Common | 19, 200 | 2, 457 | 13. 300 | 1, 509 | 21, 800 | 2, 585 | 224. 800 | 3, 062 |
| Conger | 1, 100 | 22 | 1, 400 | 19 | 800 | 12 | 94, 700 | 1, 992 |
| Flounders: | | | | | | | | |
| Gray sole | 36, 800 | 2, 988 | 184, 500 | 10, 465 | 14, 400 | 1, 217 | 1, 495. 300 | 68, 009 |
| Lemon sole | 120, 100 | 9, 358 | 465. 500 | 28, 480 | 1, 900 | 166 | 378, 300 | 21, 515 |
| Yellowtail and dab | 1, 868, 500 | 46, 607 | 3, 545. 000 | 69, 430 | 1, 600, 100 | 29, 712 | 2, 082, 900 | 44, 147 |
| Blackback | 1, 140, 200 | 38, 330 | 1, 703, 800 | 76, 973 | 672. 600 | 13, 343 | 593. 200 | 24, 778 |
| Fluke | 38. 200 | 2, 305 | 128, 800 | 10, 629 | 6, 100 | 313 | 1, 383, 900 | 99, 464 |
| Unclassified | 33, 400 | 2, 089 | 171, 200 | 4, 887 | 100 | 7 | 92, 300 | 2, 532 |
| Goosefish | -------- | -------- | -------- | -------- | -------- | -------- | 400 | 7 |
| Grayfish | 18, 600 | 153 | -------- | -------- | 23, 800 | 912 | -------- | -------- |
| Haddock | 1, 078, 800 | 28, 249 | 1, 154, 600 | 25, 700 | 2, 300 | 64 | 17, 442, 400 | 408, 958 |
| Hake | 183, 800 | 2, 772 | 52, 700 | 587 | 800 | 18 | 5, 734, 500 | 89, 953 |
| Halibut | 45, 400 | 5, 611 | 2, 800 | 303 | -------- | -------- | 669, 800 | 71, 220 |
| Herring, sea | 2, 858, 900 | 15, 258 | 3, 300 | 39 | 24, 000 | 200 | 1, 199, 500 | 14, 140 |
| King whiting or "kingfish" | -------- | -------- | 100 | 5 | -------- | -------- | 5. 100 | 102 |
| Mackerel | 6, 567, 900 | 191, 894 | 65, 100 | 2, 352 | 118, 300 | 3, 692 | 21, 900, 000 | 665, 923 |
| Menhaden | 14, 900 | 71 | 11. 200 | 69 | 13. 000 | 182 | -------- | -------- |
| Pollock | 1, 152, 700 | 11, 189 | 21, 100 | 292 | 2, 500 | 24 | 12, 171, 000 | 121, 385 |
| Rosefish | 7, 400 | 89 | 1, 076, 500 | 10, 821 | -------- | -------- | 28, 230. 600 | 333, 381 |
| Salmon | 100 | 11 | -------- | -------- | -------- | -------- | 400 | 81 |
| Scup or porgy | 48, 200 | 521 | 106. 000 | 2, 365 | 89, 600 | 1, 335 | 7, 954, 200 | 202, 131 |
| Sea bass | 5, 900 | 620 | 29, 400 | 1, 112 | 9, 400 | 730 | 1, 846, 200 | 76, 927 |
| Sea robin | 400 | 8 | -------- | -------- | -------- | -------- | 55, 000 | 908 |
| Shad | 25. 000 | 824 | 300 | 39 | 200 | 21 | 28. 400 | 1, 271 |
| Sharks | 2, 800 | 101 | 38, 400 | 1, 282 | -------- | -------- | 73, 900 | 1, 651 |
| Skates | -------- | -------- | 700 | 8 | -------- | -------- | 15, 600 | 309 |
| Skipper or "billfish" | 800 | 116 | -------- | -------- | -------- | -------- | -------- | -------- |
| Smelt | -------- | -------- | -------- | -------- | -------- | -------- | 1, 200 | 245 |
| Spot | -------- | -------- | -------- | -------- | -------- | -------- | 8, 200 | 163 |
| Squeteagues or "sea trout," gray | 194, 800 | 1, 968 | 2, 800 | 116 | 1, 900 | 29 | 61, 500 | 3, 145 |
| Striped bass | 20, 100 | 2, 500 | 600 | 72 | 38, 900 | 3, 912 | 14, 000 | 1, 421 |
| Sturgeon | 2, 400 | 207 | 200 | 28 | 100 | 16 | 3. 500 | 354 |
| Swordfish | 25. 100 | 3, 923 | 147, 800 | 23, 916 | 112, 400 | 18, 049 | 1, 326, 100 | 225, 859 |
| Tautog | 18, 100 | 588 | 13, 000 | 580 | 4, 800 | 282 | 300 | 5 |
| Tilefish | -------- | -------- | -------- | -------- | -------- | -------- | 366, 800 | 14, 438 |
| Tomcod | 11, 000 | 578 | -------- | -------- | -------- | -------- | -------- | -------- |
| Tuna | 330, 000 | 12, 066 | 100 | 5 | 7, 600 | 352 | 1, 018, 800 | 38, 245 |
| Whiting | 11, 095, 400 | 95, 561 | 101, 600 | 1, 305 | -------- | -------- | 3, 339, 000 | 37, 927 |
| Wolffish | 48, 100 | 1, 194 | 4, 000 | 57 | -------- | -------- | 181, 600 | 3, 226 |
| Yellow perch | -------- | -------- | -------- | -------- | -------- | -------- | 500 | 8 |
| Crabs, hard | 25, 700 | 999 | 4, 900 | 190 | -------- | -------- | 252, 400 | 5, 860 |
| Lobsters | 108, 100 | 33, 189 | 70, 800 | 16, 142 | 140, 900 | 31, 501 | 821, 600 | 173, 685 |
| Shrimp | -------- | -------- | -------- | -------- | -------- | -------- | 400 | 27 |

## *Fisheries of Massachusetts, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Barnstable | | Bristol | | Dukes | | Essex | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams: | | | | | | | | |
| Hard, public | 914,800 | $108,634 | 1,004,500 | $118,842 | 55,900 | $5,465 | | |
| Hard, private | 4,200 | 518 | | | | | | |
| Razor | 439,300 | 11,004 | | | | | | |
| Soft, public | 375,500 | 37,110 | 19,700 | 2,448 | 4,700 | 800 | 3,307,000 | $301,444 |
| Surf or skimmer | | | | | 1,300 | 76 | | |
| Mussels, sea | 1,300 | 90 | 4,000 | 193 | | | 700 | 10 |
| Oysters, market: | | | | | | | | |
| Public, spring | 1,800 | 280 | 6,100 | 1,150 | | | | |
| Private, spring | 193,500 | 69,315 | | | | | | |
| Periwinkles and cockles | 300 | 50 | | | | | 1,500 | 240 |
| Scallops: | | | | | | | | |
| Bay | 700,000 | 219,867 | 102,300 | 39,020 | 238,300 | 75,048 | | |
| Sea | 161,000 | 20,677 | 3,204,400 | 336,904 | 821,800 | 84,811 | 682,100 | 75,163 |
| Squid | 957,500 | 9,713 | 44,500 | 634 | 21,700 | 235 | 301,400 | 5,123 |
| Irish moss | | | | | | | 5,500 | 300 |
| Kelp | | | | | | | 120,000 | 720 |
| Bloodworms | | | | | | | 5,200 | 1,240 |
| Sandworms | | | 41,300 | 6,608 | | | 21,400 | 3,811 |
| Total | 33,238,500 | 1,051,123 | 14,784,500 | 825,579 | 4,143,700 | 278,270 | 134,152,000 | 3,518,645 |

| Species | Nantucket | | Norfolk | | Plymouth | | Suffolk | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | 480,700 | $2,698 | 6,900 | $50 |
| Bluefish | 23,000 | $1,956 | | | | | 700 | 73 |
| Butterfish | 22,400 | 642 | | | 1,200 | 118 | 191,800 | 7,650 |
| Cod | 461,900 | 9,016 | | | 177,300 | 4,152 | 94,910,300 | 1,716,206 |
| Croaker | | | | | | | 306,100 | 5,630 |
| Cusk | | | | | 700 | 24 | 2,453,300 | 41,502 |
| Eels: | | | | | | | | |
| Common | 4,800 | 505 | | | 500 | 50 | | |
| Conger | 300 | 4 | | | | | 16,400 | 231 |
| Flounders: | | | | | | | | |
| Gray sole | 8,700 | 665 | | | 124,600 | 5,039 | 5,572,400 | 203,005 |
| Lemon sole | 102,900 | 6,899 | | | 3,400 | 159 | 2,241,500 | 147,436 |
| Yellowtail and dab | 2,698,600 | 51,916 | | | 355,200 | 7,030 | 5,296,800 | 124,943 |
| Blackback | 2,463,100 | 71,790 | | | 224,600 | 5,571 | 1,948,300 | 74,826 |
| Fluke | 122,400 | 10,649 | | | | | 275,200 | 18,602 |
| Unclassified | 20,400 | 1,098 | | | 14,400 | 847 | 272,100 | 9,431 |
| Haddock | 286,200 | 6,043 | | | 162,600 | 4,796 | 135,297,600 | 2,901,955 |
| Hake | 15,800 | 164 | | | 142,300 | 1,996 | 8,634,200 | 140,321 |
| Halibut | 600 | 77 | | | | | 1,214,000 | 123,397 |
| Herring, sea | | | | | 493,400 | 4,111 | 301,600 | 2,317 |
| Herring, smelt | | | | | | | 500 | 10 |
| Mackerel | 8,000 | 240 | 7,000 | $210 | 68,600 | 3,249 | 8,098,000 | 235,713 |
| Pollock | 6,100 | 98 | | | 26,800 | 399 | 20,840,600 | 264,272 |
| Rosefish | | | | | 194,700 | 2,544 | 34,926,500 | 450,313 |
| Scup or porgy | 1,400 | 19 | | | 700 | 14 | 1,616,500 | 45,875 |
| Sea bass | | | | | 1500 | 28 | 11,7,900 | 64,640 |
| Sea robin | | | | | | | 25,100 | 372 |
| Shad | | | | | | | 600 | 16 |
| Sharks | | | | | | | 8,000 | 306 |
| Skates | | | | | | | 49,900 | 677 |
| Smelt | | | 21,000 | 4,725 | | | 3,700 | 131 |
| Squeteagues or "sea trout," gray | | | | | | | 10,700 | 792 |
| Striped bass | 7,000 | 531 | | | 1,000 | 150 | | |
| Sturgeon | 100 | 14 | | | | | 2,200 | 178 |
| Swordfish | 37,500 | 7,500 | | | | | 177,200 | 28,297 |
| Tautog | 300 | 11 | | | 1,000 | 81 | | |
| Tilefish | | | | | | | 200 | 7 |
| Tuna | | | | | 500 | 13 | 7,900 | 245 |
| Whiting | 21,800 | 218 | | | 1,609,400 | 15,535 | 8,036,200 | 115,066 |
| Wolffish | | | | | 3,300 | 47 | 2,327,000 | 43,287 |
| Yellow perch | | | | | | | 17,800 | 493 |
| Crabs, hard | | | 107,500 | 2,699 | 67,300 | 2,731 | 834,800 | 18,263 |
| Lobsters | 16,300 | 4,912 | 192,500 | 41,949 | 600,500 | 121,713 | 364,400 | 76,319 |
| Shrimp | | | | | | | 22,800 | 1,903 |
| Clams: | | | | | | | | |
| Hard, public | 178,300 | 16,421 | | | 141,000 | 13,294 | | |
| Razor | | | | | 73,600 | 2,855 | | |
| Soft, public | 10,700 | 2,225 | 33,900 | 5,278 | 972,400 | 85,003 | 25,800 | 2,550 |
| Soft, private | | | | | 28,000 | 2,500 | | |

*Fisheries of Massachusetts, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Nantucket | | Norfolk | | Plymouth | | Suffolk | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Mussels, sea | | | | | | | 9,700 | $148 |
| Oysters, market, private, spring | | | | | 26,300 | $9,000 | | |
| Periwinkles and cockles | 7,000 | $290 | | | 800 | 167 | | |
| Scallops: | | | | | | | | |
| Bay | 43,300 | 14,430 | | | 11,400 | 4,864 | | |
| Sea | 1,300 | 164 | | | | | 186,600 | 17,687 |
| Squid | | | | | 1,300 | 63 | 18,400 | 457 |
| Irish moss | | | 1,800 | $160 | 169,900 | 15,254 | | |
| Bloodworms | | | | | 4,200 | 1,000 | 16,900 | 4,049 |
| Sandworms | | | 100 | 12 | 14,300 | 3,450 | 120,300 | 22,054 |
| Total | 6,570,200 | 208,497 | 363,800 | 55,033 | 6,198,400 | 320,545 | 338,399,400 | 6,911,695 |

## RHODE ISLAND

### *Fisheries of Rhode Island, 1938*

OPERATING UNITS: BY GEAR

| Item | Purse seines, mackerel | Haul seines | Gill nets, drift | Lines | | | Pound nets | Floating traps |
|---|---|---|---|---|---|---|---|---|
| | | | | Hand | Trawl | Troll | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | 7 | 43 | 2 | 2 | | 87 |
| On boats and shore: | | | | | | | | |
| Regular | 2 | 18 | | 70 | 14 | 26 | 13 | 46 |
| Casual | | 47 | | 20 | 2 | 3 | 7 | |
| Total | 2 | 65 | 7 | 133 | 18 | 31 | 20 | 133 |
| Vessels: | | | | | | | | |
| Steam | | | | | | | | 2 |
| Net tonnage | | | | | | | | 20 |
| Motor | | | 2 | 22 | 1 | 1 | | 5 |
| Net tonnage | | | 18 | 161 | 10 | 8 | | 69 |
| Total vessels | | | 2 | 22 | 1 | 1 | | 7 |
| Total net tonnage | | | 18 | 161 | 10 | 8 | | 89 |
| Boats: | | | | | | | | |
| Motor | 1 | | | 42 | 8 | 20 | 1 | |
| Other | | 20 | | 25 | 1 | | 14 | 27 |
| Accessory boats | 1 | | 2 | 15 | 1 | | | 17 |
| Apparatus: | | | | | | | | |
| Number | 1 | 16 | 16 | 230 | 43 | 64 | 21 | 37 |
| Length, yards | 120 | 2,407 | | | | | | |
| Square yards | | | 17,640 | | | | | |
| Hooks, baits, or snoods | | | | 279 | 19,053 | 64 | | |

| Item | Fyke nets | Dip nets | Otter trawls | Box traps | Pots | | | Harpoon | Spears | Dredges, clam |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Eel | Lobster | Periwinkle and cockle | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | 44 | | | 35 | | 62 | | 15 |
| On boats and shore: | | | | | | | | | | |
| Regular | 2 | 8 | 18 | 2 | 8 | 173 | 14 | 37 | 20 | 12 |
| Casual | 1 | 21 | 2 | 3 | 19 | 77 | 8 | 6 | 4 | |
| Total | 3 | 29 | 64 | 5 | 27 | 285 | 22 | 105 | 24 | 27 |
| Vessels, motor | | | 23 | | | 16 | | 28 | | 5 |
| Net tonnage | | | 184 | | | 114 | | 214 | | 52 |
| Boats: | | | | | | | | | | |
| Motor | 2 | | 12 | | 15 | 156 | 17 | 21 | 1 | 6 |
| Other | 1 | 27 | | 4 | 11 | 8 | 1 | | 23 | |
| Accessory boats | | | | | | | | 37 | | |
| Apparatus: | | | | | | | | | | |
| Number | 38 | 29 | 35 | 2 | 1,087 | 28,995 | 1,033 | 49 | 24 | 12 |
| Yards at mouth | | | 828 | | | | | | | 12 |

## *Fisheries of Rhode Island, 1938*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Dredges—Con. | | | Tongs | | Rakes | | Forks | Hoes | By hand, other than for oyster | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mussel | Oyster | Scallop | Oyster | Other | Oyster | Other | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | | | |
| On vessels | | 76 | 3 | | | | | | | | 252 |
| On boats and shore: | | | | | | | | | | | |
| Regular | 4 | | 103 | 32 | 121 | 25 | 42 | 16 | 9 | 1 | 416 |
| Casual | | | 115 | 25 | 372 | 11 | 59 | 23 | 42 | 11 | 714 |
| Total | 4 | 76 | 221 | 57 | 493 | 36 | 101 | 39 | 51 | 12 | 1,382 |
| Vessels: | | | | | | | | | | | |
| Steam | | 1 | | | | | | | | | 3 |
| Net tonnage | | 25 | | | | | | | | | 45 |
| Motor | | 15 | 1 | | | | | | | | 63 |
| Net tonnage | | 331 | 11 | | | | | | | | 731 |
| Total vessels | | 16 | 1 | | | | | | | | 66 |
| Total net tonnage | | 356 | 11 | | | | | | | | 776 |
| Boats: | | | | | | | | | | | |
| Motor | 3 | | 125 | 9 | 63 | 1 | 13 | | 2 | | 367 |
| Other | | | 2 | 47 | 425 | 32 | 70 | 13 | 14 | 4 | 640 |
| Accessory boats | | | | | | | | | | | 59 |
| Apparatus: | | | | | | | | | | | |
| Number | 4 | 32 | 634 | 57 | 493 | 36 | 101 | 39 | 51 | | |
| Yards at mouth | 4 | 48 | 512 | | | | | | | | |

CATCH: BY GEAR

| Species | Purse seines | | Haul seines | | Gill nets, drift | | Lines, hand | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 103,600 | $530 | | | | |
| Bluefish | | | 4,100 | 330 | 3,700 | $270 | | |
| Cod | | | | | | | 612,000 | $18,608 |
| Eels, common | | | 8,500 | 994 | | | 9,400 | 932 |
| Flounders, blackback | | | 400 | 20 | | | 200 | 10 |
| Herring, sea | | | 70,000 | 350 | | | | |
| Mackerel | 600 | $9 | | | 25,000 | 750 | | |
| Pollock | | | | | | | 58,200 | 708 |
| Scup or porgy | | | | | | | 1,000 | 22 |
| Sea bass | | | | | | | 1,800 | 90 |
| Squeteagues or "sea trout," gray | | | 6,900 | 572 | | | | |
| Striped bass | | | 49,700 | 4,480 | | | | |
| Tautog | | | 1,300 | 55 | | | 68,200 | 2,576 |
| White perch | | | 2,000 | 140 | | | | |
| Squid | | | 1,000 | 20 | | | | |
| Total | 600 | 9 | 247,500 | 7,491 | 28,700 | 1,020 | 750,800 | 22,946 |

| Species | Lines—Continued | | | | Pound nets | | Floating traps | |
|---|---|---|---|---|---|---|---|---|
| | Trawl | | Troll | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | 44,300 | $277 | 13,700 | $137 |
| Anchovies | | | | | | | 61,000 | 670 |
| Bluefish | | | 6,400 | $477 | 800 | 52 | 24,400 | 2,561 |
| Bonito | | | | | | | 22,200 | 2,456 |
| Butterfish | | | | | 102,100 | 3,621 | 344,100 | 13,820 |
| Cod | 93,800 | $2,571 | | | | | 13,300 | 301 |
| Crevalle | | | | | | | 900 | 14 |
| Cunners | | | | | | | 9,400 | 94 |
| Eels: | | | | | | | | |
| Common | | | | | 8,800 | 642 | | |
| Conger | | | | | | | 10,200 | 243 |
| Flounders: | | | | | | | | |
| Blackback | | | | | 8,200 | 250 | 8,500 | 263 |
| Fluke | 1,000 | 100 | | | 4,300 | 373 | 42,600 | 3,216 |

## *Fisheries of Rhode Island, 1938*—Continued

CATCH: BY GEAR—Continued

| Species | Lines—Continued | | | | Pound nets | | Floating traps | |
|---|---|---|---|---|---|---|---|---|
| | Trawl | | Troll | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Frigate mackerel | | | | | | | 2,000 | $20 |
| Grayfish | 3,700 | $45 | | | | | 100 | 1 |
| Hake | | | | | | | 2,200 | 40 |
| Herring, sea | | | | | 15,000 | $75 | 26,200 | 264 |
| Hickory shad | | | | | | | 6,700 | 148 |
| King whiting or "kingfish" | | | | | | | 2,000 | 114 |
| Mackerel | | | 81,300 | $2,424 | 30,600 | 2,018 | 345,700 | 9,455 |
| Menhaden | | | | | 78,500 | 687 | 52,600 | 510 |
| Pollock | | | | | | | 41,900 | 790 |
| Scup or porgy | | | | | 9,400 | 222 | 1,135,500 | 20,338 |
| Sea bass | | | | | | | 65,300 | 4,857 |
| Sea robin | | | | | 10,000 | 50 | 181,900 | 1,819 |
| Shad | | | | | 200 | 20 | 2,500 | 184 |
| Sharks | | | | | | | 2,500 | 21 |
| Skates | 200 | 1 | | | | | 18,600 | 128 |
| Skipper or "billfish" | | | | | | | 600 | 60 |
| Squeteagues or "sea trout," gray | | | | | 10,900 | 592 | 43,300 | 2,386 |
| Striped bass | | | 16,900 | 1,449 | 1,800 | 159 | 141,900 | 13,779 |
| Sturgeon | | | | | | | 1,900 | 240 |
| Swordfish | | | | | | | 1,300 | 186 |
| Tautog | | | | | 36,100 | 1,430 | 31,400 | 926 |
| Tuna | | | 2,800 | 63 | | | 17,600 | 1,959 |
| Whiting | | | | | 10,400 | 89 | 117,600 | 1,176 |
| Squid | | | | | 59,400 | 1,050 | 727,800 | 11,193 |
| Turtles: | | | | | | | | |
| Green | | | | | | | 3,000 | 75 |
| Loggerhead | | | | | | | 100 | 1 |
| Total | 98,700 | 2,717 | 107,400 | 4,413 | 430,800 | 11,607 | 3,522,500 | 94,445 |

| Species | Fyke nets | | Dip nets | | Otter trawls | | Box traps | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | | | 19,000 | $250 |
| Butterfish | | | | | 100 | $4 | | |
| Cod | | | | | 16,600 | 405 | | |
| Cunners | | | | | 34,500 | 345 | | |
| Eels, common | | | | | | | 600 | 48 |
| Flounders: | | | | | | | | |
| Yellowtail and dab | | | | | 358,200 | 5,885 | | |
| Blackback | 2,000 | $80 | | | 400,400 | 13,405 | | |
| Fluke | | | | | 125,400 | 9,433 | | |
| Hake | | | | | 1,800 | 29 | | |
| Sea robin | | | | | 96,700 | 817 | | |
| Shad | | | | | | | 6,900 | 777 |
| Sharks | | | | | 800 | 18 | | |
| Skates | | | | | 202,500 | 1,585 | | |
| Tautog | 4,000 | 160 | | | 1,100 | 36 | 200 | 4 |
| Whiting | | | | | 63,200 | 1,000 | | |
| Crabs: | | | | | | | | |
| Hard | | | 600 | $75 | | | | |
| Soft and peelers | | | 300 | 100 | | | | |
| Lobsters | | | | | 300 | 75 | | |
| Scallops: | | | | | | | | |
| Bay | | | 5,500 | 1,562 | | | | |
| Sea | | | | | 400 | 118 | | |
| Squid | | | | | 5,200 | 104 | | |
| Total | 6,000 | 240 | 6,400 | 1,737 | 1,307,200 | 33,259 | 26,700 | 1,079 |

## *Fisheries of Rhode Island, 1938*—Continued

### CATCH: By gear—Continued

| Species | Pots | | | | | | Harpoons | |
|---|---|---|---|---|---|---|---|---|
| | Eel | | Lobster | | Periwinkle and cockle | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels, common | 52,700 | $4,121 | | | | | | |
| Swordfish | | | | | | | 166,600 | $24,911 |
| Tuna | | | | | | | 500 | 32 |
| Crabs, hard | | | 228,400 | $6,902 | | | | |
| Lobsters | | | 709,400 | 159,801 | | | | |
| Periwinkles and cockles | | | | | 83,100 | $4,363 | | |
| Total | 52,700 | 4,121 | 937,800 | 166,703 | 83,100 | 4,363 | 167,100 | 24,943 |

| Species | Spears | | Dredges | | Tongs | | Rakes | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels, common | 8,300 | $838 | | | | | | |
| Clams: | | | | | | | | |
| Hard, public | | | 122,500 | $10,955 | 1,545,100 | $129,822 | 387,300 | $31,382 |
| Hard, private | | | 56,300 | 5,150 | 2,000 | 225 | 4,800 | 375 |
| Limpets | | | 900 | 70 | | | | |
| Mussels, sea | | | 1,200 | 180 | | | | |
| Oysters, market: | | | | | | | | |
| Public, spring | | | | | 6,700 | 969 | 35,900 | 6,979 |
| Public, fall | | | | | 12,600 | 1,737 | 27,700 | 5,800 |
| Private, spring | | | 1,549,400 | 193,581 | 1,700 | 375 | | |
| Private, fall | | | 1,948,600 | 247,709 | 1,800 | 375 | | |
| Scallops, bay | | | 58,800 | 16,820 | | | | |
| Total | 8,300 | 838 | 3,737,700 | 474,465 | 1,569,900 | 133,503 | 455,700 | 44,536 |

| Species | Forks | | Hoes | | By hand | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams: | | | | | | |
| Hard, public | 900 | $72 | 45,300 | $4,552 | | |
| Soft, public | 169,900 | 11,996 | 58,000 | 3,942 | 9,200 | $577 |
| Total | 170,800 | 12,068 | 103,300 | 8,494 | 9,200 | 577 |

### OPERATING UNITS: By counties

| Item | Bristol | Kent | Newport | Providence | Washington |
|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 41 | 6 | 159 | 25 | 21 |
| On boats and shore: | | | | | |
| Regular | 36 | 103 | 147 | 7 | 123 |
| Casual | 67 | 296 | 145 | 62 | 144 |
| Total | 144 | 405 | 451 | 94 | 288 |
| Vessels: | | | | | |
| Steam | 1 | | 2 | | |
| Net tonnage | 25 | | 20 | | |
| Motor | 8 | 2 | 40 | 5 | 8 |
| Net tonnage | 144 | 23 | 340 | 146 | 78 |
| Total vessels | 9 | 2 | 42 | 5 | 8 |
| Total net tonnage | 169 | 23 | 360 | 146 | 78 |
| Boats: | | | | | |
| Motor | 28 | 91 | 135 | 13 | 100 |
| Other | 62 | 339 | 71 | 49 | 119 |
| Accessory boats | | | 51 | 1 | 7 |
| Apparatus: | | | | | |
| Purse seines, mackerel | | | 1 | | |
| Length, yards | | | 120 | | |
| Haul seines | 3 | | 1 | 3 | 9 |
| Length, yards | 135 | | 260 | 192 | 1,820 |
| Gill nets, drift | | | 16 | | |
| Square yards | | | 17,640 | | |

## *Fisheries of Rhode Island, 1938*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Bristol | Kent | Newport | Providence | Washington |
|---|---|---|---|---|---|
| Apparatus—Continued | | | | | |
| Lines: | *Number* | *Number* | *Number* | *Number* | *Number* |
| Hand | 4 | 24 | 165 | 2 | 35 |
| Hooks and baits | 8 | 24 | 185 | 2 | 60 |
| Trawl | 2 | --- | 29 | --- | 12 |
| Hooks | 2,000 | --- | 11,785 | --- | 5,268 |
| Troll | --- | --- | 37 | --- | 27 |
| Hooks | --- | --- | 37 | --- | 27 |
| Pound nets | --- | 2 | 15 | --- | 4 |
| Floating traps | --- | --- | 22 | --- | 15 |
| Fyke nets | --- | 18 | 20 | --- | --- |
| Dip nets | --- | 5 | --- | --- | 24 |
| Otter trawl | --- | --- | 21 | --- | 14 |
| Yards at mouth | --- | --- | 517 | --- | 311 |
| Box traps | 2 | --- | --- | --- | --- |
| Pots: | | | | | |
| Eel | 50 | 265 | 182 | 145 | 445 |
| Lobster | 2,000 | 1,088 | 16,195 | 150 | 9,562 |
| Periwinkle and cockle | 396 | 50 | 327 | --- | 260 |
| Harpoons | 1 | --- | 39 | 1 | 8 |
| Spears | 1 | 20 | --- | 3 | --- |
| Dredges: | | | | | |
| Clam | 3 | --- | 9 | --- | --- |
| Yards at mouth | 3 | --- | 9 | --- | --- |
| Mussel | 3 | 1 | --- | --- | --- |
| Yards at mouth | 3 | 1 | --- | --- | --- |
| Oyster | 16 | 4 | --- | 8 | 4 |
| Yards at mouth | 24 | 6 | --- | 12 | 6 |
| Scallop | 34 | 255 | 152 | 14 | 179 |
| Yards at mouth | 27 | 211 | 119 | 11 | 144 |
| Tongs: | | | | | |
| Oyster | --- | 40 | 4 | 9 | 4 |
| Other | 60 | 290 | 34 | 52 | 57 |
| Rakes: | | | | | |
| Oyster | --- | 18 | 1 | --- | 17 |
| Other | --- | 61 | 27 | --- | 13 |
| Forks | 3 | 27 | 1 | 3 | 5 |
| Hoes | 12 | --- | 8 | 8 | 23 |

### CATCH: BY COUNTIES

| Species | Bristol | | Kent | | Newport | | Providence | | Washington | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 19,000 | $250 | --- | --- | 47,400 | $308 | --- | --- | 114,200 | $636 |
| Anchovies | --- | --- | --- | --- | 61,000 | 670 | --- | --- | --- | --- |
| Bluefish | --- | --- | --- | --- | 28,400 | 2,936 | --- | --- | 11,000 | 754 |
| Bonito | --- | --- | --- | --- | 20,000 | 2,276 | --- | --- | 2,200 | 180 |
| Butterfish | --- | --- | 2,500 | $125 | 350,900 | 14,223 | --- | --- | 92,900 | 3,097 |
| Cod | --- | --- | 1,800 | 38 | 664,500 | 19,983 | --- | --- | 69,400 | 1,864 |
| Crevalle | --- | --- | --- | --- | 700 | 10 | --- | --- | 200 | 4 |
| Cunners | --- | --- | --- | --- | 33,500 | 335 | --- | --- | 10,400 | 104 |
| Eels: | | | | | | | | | | |
| Common | 4,000 | 374 | 23,200 | 2,320 | 19,600 | 1,193 | 14,700 | $1,692 | 26,800 | 1,996 |
| Conger | --- | --- | --- | --- | 7,600 | 192 | --- | --- | 2,600 | 51 |
| Flounders: | | | | | | | | | | |
| Yellowtail and dab | --- | --- | --- | --- | 284,600 | 5,141 | --- | --- | 73,600 | 744 |
| Blackback | 600 | 30 | 500 | 20 | 219,900 | 6,364 | --- | --- | 198,700 | 7,614 |
| Fluke | --- | --- | --- | --- | 94,000 | 7,011 | --- | --- | 79,300 | 6,111 |
| Frigate mackerel | --- | --- | --- | --- | 2,000 | 20 | --- | --- | --- | --- |
| Grayfish | 3,700 | 45 | --- | --- | --- | --- | --- | --- | 100 | 1 |
| Hake | --- | --- | --- | --- | 2,200 | 40 | --- | --- | 1,800 | 29 |
| Herring, sea | --- | --- | --- | --- | 26,200 | 189 | --- | --- | 85,000 | 500 |
| Hickory shad | --- | --- | --- | --- | 5,300 | 141 | --- | --- | 1,400 | 7 |
| King whiting or or "kingfish" | --- | --- | --- | --- | 1,800 | 106 | --- | --- | 200 | 8 |
| Mackerel | --- | --- | --- | --- | 422,800 | 13,056 | --- | --- | 60,400 | 1,600 |
| Menhaden | --- | --- | --- | --- | 3,400 | 34 | --- | --- | 127,700 | 1,163 |
| Pollock | --- | --- | --- | --- | 96,300 | 1,427 | --- | --- | 3,800 | 71 |
| Scup or porgy | 200 | 6 | --- | --- | 1,114,700 | 20,231 | --- | --- | 31,000 | 345 |
| Sea bass | --- | --- | --- | --- | 66,900 | 4,934 | --- | --- | 200 | 13 |
| Sea robin | --- | --- | --- | --- | 220,000 | 2,150 | --- | --- | 68,600 | 536 |
| Shad | 6,900 | 777 | --- | --- | 2,100 | 146 | --- | --- | 600 | 58 |
| Sharks | --- | --- | --- | --- | 1,200 | 22 | --- | --- | 2,100 | 17 |
| Skates | 200 | 1 | --- | --- | 181,100 | 1,463 | --- | --- | 40,000 | 250 |

## *Fisheries of Rhode Island, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Bristol | | Kent | | Newport | | Providence | | Washington | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Skipper or "billfish" | | | | | 600 | $60 | | | | |
| Squeteagues or "sea trout," gray | 2,700 | $200 | 300 | $21 | 39,000 | 1,998 | | | 19,100 | $1,331 |
| Striped bass | | | | | 124,400 | 12,342 | | | 85,900 | 7,525 |
| Sturgeon | | | | | 1,400 | 200 | | | 500 | 40 |
| Swordfish | 1,600 | 300 | | | 144,300 | 21,046 | 2,900 | $396 | 19,100 | 3,355 |
| Tautog | 1,000 | 44 | 3,000 | 150 | 85,500 | 3,132 | 500 | 15 | 52,300 | 1,846 |
| Tuna | | | | | 20,900 | 2,054 | | | | |
| White perch | | | | | 2,000 | 140 | | | | |
| Whiting | | | | | 186,200 | 2,215 | | | 5,000 | 50 |
| Crabs: | | | | | | | | | | |
| Hard | 192,000 | 5,760 | 4,300 | 178 | 22,900 | 688 | | | 9,800 | 351 |
| Soft and peelers | | | | | | | | | 300 | 100 |
| Lobsters | 20,100 | 5,014 | 30,800 | 6,658 | 427,400 | 97,352 | 1,700 | 309 | 229,700 | 50,543 |
| Clams: | | | | | | | | | | |
| Hard, public | 198,900 | 18,584 | 1,417,400 | 110,737 | 193,200 | 17,636 | 74,800 | 9,320 | 216,800 | 20,506 |
| Hard, private | 57,100 | 5,225 | 4,800 | 375 | | | 1,200 | 150 | | |
| Soft, public | 17,800 | 1,274 | 104,000 | 7,650 | 16,700 | 1,254 | 42,000 | 2,650 | 56,600 | 3,687 |
| Limpets | 900 | 70 | | | | | | | | |
| Mussels, sea | | | 1,200 | 180 | | | | | | |
| Oysters, market: | | | | | | | | | | |
| Public, spring | | | 9,800 | 1,400 | 6,900 | 998 | | | 25,900 | 5,550 |
| Public, fall | | | 6,000 | 862 | 7,100 | 999 | 1,200 | 106 | 26,000 | 5,570 |
| Private, spring | 900,500 | 103,080 | 49,000 | 7,000 | | | 500,400 | 66,920 | 101,200 | 16,956 |
| Private, fall | 967,500 | 112,585 | | | | | 881,600 | 118,542 | 101,300 | 16,957 |
| Periwinkles and cockles | 31,900 | 1,770 | 900 | 25 | 28,300 | 1,468 | | | 22,000 | 1,100 |
| Scallops: | | | | | | | | | | |
| Bay | 1,800 | 528 | 18,300 | 5,238 | 15,600 | 4,446 | 1,500 | 440 | 27,100 | 7,730 |
| Sea | | | | | 200 | 54 | | | 200 | 64 |
| Squid | 1,000 | 20 | | | 380,400 | 6,471 | | | 412,000 | 5,876 |
| Turtles: | | | | | | | | | | |
| Green | | | | | 3,000 | 75 | | | | |
| Loggerhead | | | | | | | | | 100 | 1 |
| Total | 2,429,400 | 255,937 | 1,677,800 | 142,977 | 5,684,100 | 279,229 | 1,522,500 | 200,540 | 2,515,100 | 176,891 |

# CONNECTICUT

## *Fisheries of Connecticut, 1938*

OPERATING UNITS: BY GEAR

| Item | Purse seines, mackerel | Haul seines | Gill nets | | | | Lines | |
|---|---|---|---|---|---|---|---|---|
| | | | Anchor | Drift | Run-around | Stake | Hand | Trot with hooks |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | | | | 11 | |
| On boats and shore: | | | | | | | | |
| Regular | 3 | 2 | | 14 | 2 | 8 | 40 | |
| Casual | | 66 | 5 | 98 | | 14 | 12 | 5 |
| Total | 3 | 68 | 5 | 112 | 2 | 22 | 63 | 5 |
| Vessels, motor | | | | | | | 4 | |
| Net tonnage | | | | | | | 38 | |
| Boats: | | | | | | | | |
| Motor | 1 | 3 | 1 | 22 | 1 | 7 | 29 | 2 |
| Other | | 18 | 1 | 20 | | 3 | 3 | 2 |
| Accessory boats | 1 | | | | | | | |
| Apparatus: | | | | | | | | |
| Number | 1 | 23 | 2 | 42 | 1 | 17 | 63 | 14 |
| Length, yards | 150 | 3,079 | | | | | | |
| Square yards | | | 375 | 102,843 | 330 | 2,699 | | |
| Hooks, baits, or snoods | | | | | | | 80 | 1,600 |

## *Fisheries of Connecticut, 1938*—Continued

### OPERATING UNITS: BY GEAR—Continued

| Item | Pound nets | Fyke nets | Dip nets | Otter trawls | Pots | | | Harpoons | Spears |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Eel | Fish | Lobster | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | 77 | | | 8 | 28 | |
| On boats and shore: | | | | | | | | | |
| Regular | 9 | 3 | 7 | 51 | 14 | 2 | 158 | 7 | |
| Casual | 9 | 28 | 131 | 9 | 66 | 1 | 191 | | 2 |
| Total | 18 | 31 | 138 | 137 | 80 | 3 | 357 | 35 | 2 |
| Vessels, motor | | | | 33 | | | 4 | 10 | |
| Net tonnage | | | | 374 | | | 26 | 127 | |
| Boats: | | | | | | | | | |
| Motor | 8 | 6 | | 30 | 16 | 2 | 168 | 3 | |
| Other | 1 | 12 | 130 | | 35 | | 38 | | 2 |
| Accessory boats | | | | | | | | 10 | |
| Apparatus: | | | | | | | | | |
| Number | 15 | 49 | 131 | 63 | 1,894 | 24 | 20,342 | 13 | 2 |
| Yards at mouth | | | | 1,463 | | | | | |

| Item | Dredges, oyster | Tongs | | Rakes | | Forks | Hoes | By hand, other than for oysters | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|
| | | Oyster | Other | Oyster | Other | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 194 | | | | | | | | 278 |
| On boats and shore: | | | | | | | | | |
| Regular | 8 | 34 | 27 | 3 | 16 | | 7 | | 265 |
| Casual | | 10 | 66 | | 63 | 3 | 18 | 20 | 656 |
| Total | 202 | 44 | 93 | 3 | 79 | 3 | 25 | 20 | 1,199 |
| Vessels: | | | | | | | | | |
| Steam | 3 | | | | | | | | 3 |
| Net tonnage | 581 | | | | | | | | 581 |
| Motor | 30 | | | | | | | | 65 |
| Net tonnage | 809 | | | | | | | | 1,202 |
| Total vessels | 33 | | | | | | | | 68 |
| Total net tonnage | 1,390 | | | | | | | | 1,783 |
| Boats: | | | | | | | | | |
| Motor | 4 | 4 | 3 | | | 1 | | | 238 |
| Other | | 37 | 90 | 3 | 79 | 2 | 4 | | 365 |
| Accessory boats | | | | | | | | | 11 |
| Apparatus: | | | | | | | | | |
| Number | 74 | 44 | 93 | 3 | 79 | 3 | 25 | | |
| Yards at mouth | 104 | | | | | | | | |

### CATCH: BY GEAR

| Species | Purse seines | | Haul seines | | Gill nets | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Anchor | | Drift | | Runaround | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 4,000 | $40 | | | | | | |
| Carp | | | 28,200 | 1,692 | | | 2,500 | $150 | | |
| Mackerel | 2,000 | $40 | | | | | | | | |
| Menhaden | | | | | | | | | 1,000 | $5 |
| Minnows | | | 600 | 79 | | | | | | |
| Shad | | | 161,800 | 6,567 | 1,200 | $114 | 247,700 | 18,239 | | |
| Striped bass | | | | | | | 500 | 55 | | |
| Suckers | | | 16,600 | 328 | | | | | | |
| Total | 2,000 | 40 | 211,200 | 8,706 | 1,200 | 114 | 250,700 | 18,444 | 1,000 | 5 |

## *Fisheries of Connecticut, 1938*—Continued

CATCH: BY GEAR—Continued

| Species | Gill nets—Continued | | Lines | | | | Pound nets | | Fyke nets | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Stake | | Hand | | Trot with hooks | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | -------- | ------ | -------- | ------- | -------- | ------ | 10, 300 | $103 | 14, 000 | $140 |
| Bluefish | -------- | ------ | 10, 100 | $1, 511 | -------- | ------ | -------- | ------ | -------- | ------ |
| Butterfish | -------- | ------ | -------- | ------- | -------- | ------ | 33, 100 | 769 | 100 | 2 |
| Carp | -------- | ------ | -------- | ------- | -------- | ------ | -------- | ------ | 4, 100 | 222 |
| Cod | -------- | ------ | 11, 400 | 342 | -------- | ------ | -------- | ------ | -------- | ------ |
| Eels: | | | | | | | | | | |
| Common | -------- | ------ | 3, 200 | 291 | 6, 800 | $408 | 400 | 24 | 3, 800 | 228 |
| Conger | -------- | ------ | -------- | ------- | -------- | ------ | 100 | 6 | -------- | ------ |
| Flounders: | | | | | | | | | | |
| Blackback | -------- | ------ | 400 | 16 | -------- | ------ | 1, 900 | 76 | 3, 100 | 124 |
| Fluke | -------- | ------ | -------- | ------- | -------- | ------ | 500 | 25 | -------- | ------ |
| Hickory shad | -------- | ------ | -------- | ------- | -------- | ------ | 400 | 4 | -------- | ------ |
| Kingfish or "king mackerel" | -------- | ------ | -------- | ------- | -------- | ------ | -------- | ------ | 100 | 2 |
| Lamprey | -------- | ------ | -------- | ------- | -------- | ------ | -------- | ------ | 1, 900 | 56 |
| Mackerel | -------- | ------ | 47, 900 | 1, 171 | -------- | ------ | -------- | ------ | -------- | ------ |
| Menhaden | 30, 200 | $151 | -------- | ------- | -------- | ------ | 126, 000 | 234 | 500 | 3 |
| Pollock | -------- | ------ | 45, 900 | 676 | -------- | ------ | -------- | ------ | -------- | ------ |
| Scup or porgy | -------- | ------ | 3, 800 | 76 | -------- | ------ | 400 | 8 | -------- | ------ |
| Sea bass | -------- | ------ | 10, 200 | 970 | -------- | ------ | 300 | 30 | -------- | ------ |
| Shad | 7, 300 | 376 | -------- | ------- | -------- | ------ | 6, 700 | 347 | -------- | ------ |
| Skates | -------- | ------ | -------- | ------- | -------- | ------ | 1, 800 | 22 | 200 | 2 |
| Squeteagues or "sea trout" | -------- | ------ | -------- | ------- | -------- | ------ | 6, 200 | 261 | -------- | ------ |
| Striped bass | -------- | ------ | 200 | 28 | -------- | ------ | 8, 300 | 860 | -------- | ------ |
| Sturgeon | -------- | ------ | -------- | ------- | -------- | ------ | -------- | ------ | 200 | 69 |
| Suckers | -------- | ------ | -------- | ------- | -------- | ------ | -------- | ------ | 77, 000 | 1, 503 |
| Tautog | -------- | ------ | 11, 300 | 280 | -------- | ------ | 6, 100 | 144 | 200 | 4 |
| Squid | -------- | ------ | -------- | ------- | -------- | ------ | 6, 700 | 134 | -------- | ------ |
| Total | 37, 500 | 527 | 144, 400 | 5, 361 | 6, 800 | 408 | 209, 200 | 3, 047 | 105, 200 | 2, 355 |

| Species | Dip nets | | Otter trawls | | Pots | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Eel | | Fish | | Lobster | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Butterfish | -------- | -------- | 157, 100 | $3, 210 | -------- | ------- | -------- | ------ | -------- | -------- |
| Carp | -------- | -------- | -------- | -------- | 500 | $30 | -------- | ------ | -------- | -------- |
| Cod | -------- | -------- | 100, 400 | 3, 012 | -------- | ------- | -------- | ------ | -------- | -------- |
| Cunners | -------- | -------- | 1, 000 | 10 | -------- | ------- | -------- | ------ | -------- | -------- |
| Eels: | | | | | | | | | | |
| Common | -------- | -------- | -------- | -------- | 41, 000 | 2, 463 | -------- | ------ | -------- | -------- |
| Conger | -------- | -------- | 1, 000 | 10 | -------- | ------- | -------- | ------ | -------- | -------- |
| Flounders: | | | | | | | | | | |
| Yellowtail and dab | -------- | -------- | 1, 757, 700 | 23, 722 | -------- | ------- | -------- | ------ | -------- | -------- |
| Blackback | -------- | -------- | 2, 521, 800 | 99, 669 | -------- | ------- | -------- | ------ | -------- | -------- |
| Fluke | -------- | -------- | 282, 100 | 20, 185 | -------- | ------- | -------- | ------ | -------- | -------- |
| Hake | -------- | -------- | 8, 000 | 140 | -------- | ------- | -------- | ------ | -------- | -------- |
| Scup or porgy | -------- | -------- | 116, 800 | 2, 351 | -------- | ------- | -------- | ------ | -------- | -------- |
| Sea bass | -------- | -------- | 46, 200 | 4, 620 | -------- | ------- | -------- | ------ | -------- | -------- |
| Sea robin | -------- | -------- | 4, 000 | 80 | -------- | ------- | -------- | ------ | -------- | -------- |
| Shad | 2, 100 | $145 | -------- | -------- | -------- | ------- | -------- | ------ | -------- | -------- |
| Skates | -------- | -------- | 64, 000 | 648 | -------- | ------- | -------- | ------ | -------- | -------- |
| Tautog | -------- | -------- | 500 | 13 | -------- | ------- | 600 | $16 | -------- | -------- |
| Whiting | -------- | -------- | 52, 700 | 786 | -------- | ------- | -------- | ------ | -------- | -------- |
| Crabs, hard | 2, 800 | 165 | -------- | -------- | -------- | ------- | -------- | ------ | -------- | -------- |
| Lobsters | -------- | -------- | -------- | -------- | -------- | ------- | -------- | ------ | 553, 600 | $136, 047 |
| Scallops, bay | 66, 800 | 13, 624 | -------- | -------- | -------- | ------- | -------- | ------ | -------- | -------- |
| Squid | -------- | -------- | 3, 000 | 30 | -------- | ------- | -------- | ------ | -------- | -------- |
| Total | 71, 700 | 13, 934 | 5, 116, 300 | 158, 486 | 41, 500 | 2, 493 | 600 | 16 | 553, 600 | 136, 047 |

## *Fisheries of Connecticut, 1938*—Continued

### CATCH: BY GEAR—Continued

| Species | Harpoons | | Spears | | Dredges | | Tongs | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels, common | | | 500 | $30 | | | | |
| Swordfish | 34,000 | $7,133 | | | | | | |
| Clams, hard, public | | | | | | | 97,200 | $20,047 |
| Oysters, market: | | | | | | | | |
| Public, spring | | | | | | | 14,700 | 2,662 |
| Public, fall | | | | | 1,500 | $350 | 27,700 | 4,453 |
| Private, spring | | | | | 1,980,100 | 430,336 | 3,600 | 702 |
| Private, fall | | | | | 2,792,700 | 577,293 | 4,500 | 960 |
| Total | 34,000 | 7,133 | 500 | 30 | 4,774,300 | 1,007,979 | 147,700 | 28,824 |

| Species | Rakes | | Forks | | Hoes | | By hand | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams: | | | | | | | | |
| Hard, public | 93,900 | $19,011 | 3,400 | $656 | | | 16,000 | $3,860 |
| Soft, public | | | | | 15,500 | $2,636 | | |
| Oysters, market: | | | | | | | | |
| Private, spring | 200 | 62 | | | | | | |
| Private, fall | 200 | 62 | | | | | | |
| Total | 94,300 | 19,135 | 3,400 | 656 | 15,500 | 2,636 | 16,000 | 3,860 |

### OPERATING UNITS: BY COUNTIES

| Item | Fairfield | Hartford | Middlesex | New Haven | New London |
|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 74 | | 4 | 134 | 66 |
| On boats and shore: | | | | | |
| Regular | 62 | | 52 | 55 | 96 |
| Casual | 112 | 69 | 151 | 48 | 276 |
| Total | 248 | 69 | 207 | 237 | 438 |
| Vessels: | | | | | |
| Steam | 1 | | | 2 | |
| Net tonnage | 51 | | | 530 | |
| Motor | 17 | | 2 | 20 | 26 |
| Net tonnage | 274 | | 22 | 589 | 317 |
| Total vessels | 18 | | 2 | 22 | 26 |
| Total net tonnage | 325 | | 22 | 1,119 | 317 |
| Boats: | | | | | |
| Motor | 36 | 1 | 51 | 36 | 114 |
| Other | 96 | 28 | 47 | 39 | 155 |
| Accessory boats | | | 1 | 1 | 9 |
| Apparatus: | | | | | |
| Purse seines, mackerel | | | | | 1 |
| Length, yards | | | | | 150 |
| Haul seines | | 12 | 7 | 2 | 2 |
| Length, yards | | 1,859 | 947 | 40 | 233 |
| Gill nets: | | | | | |
| Anchor | | | 1 | | 1 |
| Square yards | | | 111 | | 264 |
| Drift | 1 | 2 | 31 | | 8 |
| Square yards | 2,200 | 4,440 | 82,877 | | 13,326 |
| Runaround | 1 | | | | |
| Square yards | 330 | | | | |
| Stake | | 7 | 7 | 1 | 2 |
| Square yards | | 777 | 1,600 | 100 | 222 |
| Lines: | | | | | |
| Hand | 6 | | 13 | 10 | 34 |
| Hooks | 6 | | 17 | 15 | 42 |
| Trot with hooks | 2 | | | 12 | |
| Hooks | 400 | | | 1,200 | |
| Pound nets | | | 1 | 3 | 11 |
| Fyke nets | | 28 | 6 | 1 | 14 |
| Dip nets | 3 | 7 | | | 121 |
| Otter trawls | 6 | | 5 | 5 | 47 |
| Yards at mouth | 124 | | 98 | 112 | 1,129 |

## *Fisheries of Connecticut, 1938*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Fairfield | Hartford | Middlesex | New Haven | New London |
|---|---|---|---|---|---|
| Apparatus—Continued. | | | | | |
| Pots: | *Number* | *Number* | *Number* | *Number* | *Number* |
| Eel | 51 | 112 | 510 | 72 | 1,149 |
| Fish | 24 | | | | |
| Lobster | 3,563 | | 2,061 | 4,751 | 9,967 |
| Harpoons | | | 2 | 1 | 10 |
| Spears | | | | | 2 |
| Dredges, oyster | 30 | | | 42 | 2 |
| Yards at mouth | 40 | | | 62 | 2 |
| Tongs: | | | | | |
| Oyster | 11 | | 18 | 12 | 3 |
| Other | 79 | | | 10 | 4 |
| Rakes: | | | | | |
| Oyster | 3 | | | | |
| Other | 79 | | | | |
| Forks | | | | | 3 |
| Hoes | 19 | | 2 | 4 | |

### CATCH: BY COUNTIES

| Species | Fairfield | | Hartford | | Middlesex | | New Haven | | New London | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Lbs.* | *Value* | *Lbs.* | *Value* | *Lbs.* | *Value* | *Lbs.* | *Value* | *Lbs.* | *Value* |
| Alewives | | | 15,900 | $159 | | | | | 12,400 | $124 |
| Bluefish | 300 | $41 | | | 3,200 | $480 | 400 | $60 | 6,200 | 930 |
| Butterfish | | | | | | | 3,700 | 129 | 186,600 | 3,852 |
| Carp | | | 21,600 | 1,272 | 6,800 | 408 | | | 6,900 | 414 |
| Cod | | | | | | | 1,000 | 30 | 110,800 | 3,324 |
| Cunners | | | | | | | | | 1,000 | 10 |
| Eels: | | | | | | | | | | |
| Common | 2,800 | 186 | 3,500 | 210 | 14,200 | 852 | 10,700 | 642 | 24,500 | 1,554 |
| Conger | | | | | | | | | 1,100 | 16 |
| Flounders: | | | | | | | | | | |
| Yellowtail and dab | | | | | 42,300 | 423 | 4,400 | 88 | 1,711,000 | 23,211 |
| Blackback | 87,400 | 3,072 | | | 12,200 | 472 | 83,500 | 2,890 | 2,344,100 | 93,451 |
| Fluke | | | | | 4,100 | 335 | 5,000 | 250 | 273,500 | 19,625 |
| Hake | | | | | | | | | 8,000 | 140 |
| Hickory shad | | | | | | | | | 400 | 4 |
| Kingfish or "king mackerel" | | | | | | | | | 100 | 2 |
| Lamprey | | | 1,900 | 56 | | | | | | |
| Mackerel | | | | | 900 | 20 | 5,000 | 100 | 44,000 | 1,091 |
| Menhaden | 1,000 | 5 | | | 23,400 | 117 | 19,200 | 96 | 114,100 | 175 |
| Minnows | | | | | | | 600 | 79 | | |
| Pollock | | | | | 20,900 | 286 | | | 25,000 | 390 |
| Scup or porgy | | | | | 400 | 8 | 1,000 | 20 | 119,600 | 2,407 |
| Sea bass | | | | | 1,200 | 120 | | | 55,500 | 5,500 |
| Sea robin | | | | | | | | | 4,000 | 80 |
| Shad | 7,500 | 543 | 110,600 | 3,902 | 229,900 | 14,391 | 200 | 10 | 78,600 | 6,942 |
| Skates | | | | | | | 1,200 | 12 | 64,800 | 660 |
| Squeteagues or "sea trout," gray | | | | | | | 1,300 | 65 | 4,900 | 196 |
| Striped bass | | | | | 500 | 55 | 100 | 12 | 8,400 | 876 |
| Sturgeon | | | | | | | | | 200 | 69 |
| Suckers | | | 71,000 | 1,383 | 13,700 | 270 | | | 8,900 | 178 |
| Swordfish | | | | | 9,300 | 1,970 | 4,000 | 600 | 20,700 | 4,563 |
| Tautog | 900 | 25 | | | 8,800 | 205 | 200 | 6 | 8,800 | 221 |
| Whiting | | | | | | | | | 52,700 | 786 |
| Crabs, hard | 2,100 | 98 | | | | | | | 700 | 67 |
| Lobsters | 73,300 | 18,389 | | | 58,100 | 14,513 | 122,100 | 27,496 | 300,100 | 75,649 |
| Clams: | | | | | | | | | | |
| Hard, public | 189,100 | 39,988 | | | | | 14,500 | 2,325 | 6,900 | 1,261 |
| Soft, public | 12,100 | 1,995 | | | 1,000 | 150 | 2,400 | 491 | | |
| Oysters, market: | | | | | | | | | | |
| Public, spring | 3,800 | 800 | | | 8,900 | 1,424 | | | 2,000 | 438 |
| Public, fall | 4,700 | 875 | | | 3,300 | 528 | 21,200 | 3,400 | | |
| Private, spring | 714,000 | 142,897 | | | 1,200 | 192 | 1,251,800 | 284,301 | 16,900 | 3,710 |
| Private, fall | 1,761,300 | 344,098 | | | | | 1,023,700 | 231,607 | 12,400 | 2,610 |
| Scallops, bay | | | | | | | | | 66,800 | 13,624 |
| Squid | | | | | | | | | 9,700 | 164 |
| Total | 2,860,300 | 553,012 | 224,500 | 6,982 | 464,300 | 37,219 | 2,577,200 | 554,709 | 5,712,300 | 268,314 |

## VESSEL FISHERIES AT PRINCIPAL NEW ENGLAND PORTS

Due to the importance of the ports of Boston and Gloucester, Mass., and Portland, Maine, as landing points for fishery products, detailed monthly statistics are collected for these landings which are published in the following section. These landings are included in the catch by States appearing elsewhere in this document, but are presented here for their value in detailed form.

### ECONOMIC ASPECT

The landings of fishery products at the three principal New England ports (Boston, Gloucester, and Portland), by vessels of 5 net tons capacity or more, during 1938, amounted to 400,611,381 pounds as landed, valued at $8,956,523. This is an increase of 3 percent in the quantity of the catch as compared with 1937, but a decrease of 9 percent in the value of the catch. Of the total landings, 99 percent consisted of fresh fish and 1 percent salted fish. The landings at Boston accounted for 318,745,176 pounds, valued at $7,623,465, or 79 percent of the total volume; the landings at Gloucester amounted to 63,009,136 pounds, valued at $971,986, or 16 percent of the total; and the landings at Portland amounted to 18,857,069 pounds, valued at $361,072, or 5 percent of the total.

Among the landings of fresh fish, haddock far outranked other species in volume landed, the landings of all sizes in 1938 amounting to 134,876,845 pounds, or 34 percent of the total fresh fish.

*Landings by fishing vessels at the three principal New England ports, 1938*

BOSTON: BY MONTHS

| Species | January | | February | | March | | April | | May | | June | | July | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod, fresh: | | | | | | | | | | | | | | |
| Large | 2,540,785 | $77,186 | 3,339,775 | $88,610 | 5,197,020 | $122,664 | 3,377,170 | $66,569 | 3,018,180 | $45,913 | 1,583,675 | $38,120 | 1,534,555 | $36,755 |
| Market | 3,226,449 | 99,572 | 2,140,785 | 66,730 | 4,107,010 | 98,657 | 4,518,485 | 67,016 | 5,926,568 | 69,862 | 4,451,455 | 64,562 | 4,897,015 | 72,818 |
| Scrod | 135,645 | 3,371 | 29,360 | 728 | 19,000 | 464 | 63,750 | 981 | 77,200 | 783 | 209,500 | 2,654 | 222,475 | 3,016 |
| Haddock, fresh: | | | | | | | | | | | | | | |
| Large | 6,282,965 | 251,591 | 9,987,970 | 318,896 | 13,600,330 | 366,675 | 13,151,450 | 242,154 | 7,648,845 | 173,020 | 6,625,325 | 151,860 | 5,422,415 | 142,451 |
| Scrod | 1,143,870 | 36,217 | 1,832,320 | 50,670 | 2,367,900 | 54,543 | 3,061,070 | 49,606 | 1,812,463 | 28,930 | 2,928,465 | 46,030 | 3,757,835 | 59,284 |
| Hake, fresh: | | | | | | | | | | | | | | |
| Large | 1,061,565 | 34,335 | 612,795 | 22,819 | 420,885 | 16,358 | 409,330 | 12,192 | 305,505 | 5,561 | 343,110 | 5,412 | 343,325 | 4,927 |
| Small | 24,150 | 726 | 25,600 | 895 | 31,700 | 1,055 | 32,000 | 781 | 63,300 | 1,249 | 99,012 | 1,723 | 169,200 | 2,903 |
| Pollock, fresh | 3,603,295 | 60,313 | 1,355,345 | 25,595 | 1,451,650 | 27,574 | 1,676,645 | 20,715 | 1,459,285 | 15,586 | 518,285 | 7,184 | 609,410 | 9,804 |
| Cusk, fresh | 575,530 | 16,089 | 232,680 | 6,208 | 533,755 | 11,705 | 334,055 | 5,292 | 293,300 | 3,869 | 114,225 | 1,877 | 139,335 | 2,176 |
| Halibut, fresh | 36,800 | 6,359 | 85,420 | 13,785 | 198,418 | 31,887 | 200,351 | 23,697 | 176,646 | 17,176 | 239,411 | 23,140 | 147,359 | 16,139 |
| Mackerel, fresh | 15,075 | 1,276 | | | | | 287,250 | 5,582 | 4,185,730 | 80,596 | 2,741,510 | 72,841 | 3,205,535 | 76,116 |
| Flounders, fresh: | | | | | | | | | | | | | | |
| Gray sole | 1,295,365 | 41,260 | 1,344,290 | 36,156 | 794,180 | 33,852 | 342,440 | 19,334 | 630,115 | 17,659 | 471,405 | 16,345 | 217,090 | 9,286 |
| Lemon sole | 143,845 | 11,190 | 95,370 | 8,912 | 146,448 | 11,376 | 79,531 | 5,423 | 266,760 | 7,455 | 163,075 | 7,923 | 127,720 | 9,023 |
| Yellowtail | 305,250 | 7,946 | 126,930 | 3,841 | 177,675 | 4,571 | 138,749 | 4,772 | 283,640 | 4,902 | 146,895 | 3,671 | 294,285 | 6,343 |
| Blackback | 79,150 | 3,908 | 43,215 | 2,298 | 30,180 | 1,569 | 30,475 | 1,050 | 81,270 | 1,664 | 75,675 | 2,381 | 72,630 | 2,417 |
| Dab | 69,610 | 1,669 | 104,865 | 2,166 | 155,095 | 3,755 | 232,965 | 5,365 | 355,265 | 5,072 | 463,905 | 8,370 | 204,805 | 4,578 |
| Other | 38,500 | 1,170 | 21,830 | 591 | 32,860 | 1,173 | 25,630 | 1,226 | 70,745 | 1,549 | 31,235 | 790 | 7,413 | 228 |
| Swordfish, fresh | | | | | | | | | | | 41,801 | 13,553 | 267,478 | 69,450 |
| Whiting, fresh | 141,685 | 1,766 | 905 | 28 | 6,740 | 193 | 40,795 | 1,434 | 656,857 | 12,917 | 2,345,329 | 35,526 | 774,900 | 10,284 |
| Wolffish, fresh | 136,965 | 4,013 | 144,895 | 4,321 | 302,105 | 7,413 | 385,805 | 7,757 | 428,965 | 6,998 | 213,340 | 4,037 | 68,945 | 1,530 |
| Rosefish, fresh | 6,037,861 | 82,995 | 2,281,156 | 34,852 | 3,038,676 | 43,314 | 1,258,425 | 17,996 | 3,392,771 | 40,626 | 2,280,679 | 23,131 | 1,895,824 | 21,161 |
| Other, fresh | 5,930 | 438 | 10,245 | 436 | 9,855 | 249 | 36,298 | 2,355 | 7,920 | 82 | 41,640 | 2,858 | 83,377 | 5,487 |
| Total, fresh | 26,900,293 | 743,390 | 23,815,751 | 688,537 | 32,621,482 | 839,047 | 29,682,669 | 561,297 | 31,141,330 | 541,469 | 26,128,952 | 533,988 | 24,462,926 | 566,176 |
| Landed in 1937, fresh | 21,194,272 | 630,144 | 24,425,442 | 672,570 | 30,523,765 | 771,813 | 26,866,266 | 602,120 | 28,687,024 | 623,694 | 29,994,985 | 639,796 | 28,703,736 | 673,982 |

*Landings by fishing vessels at the three principal New England ports, 1938*—Continued

BOSTON: By months—Continued

| Species | August | | September | | October | | November | | December | | Total, 1938 | | Total, 1937 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod, fresh: | | | | | | | | | | | | | | |
| Large | 1,108,565 | $32,613 | 1,059,410 | $43,329 | 1,902,386 | $60,267 | 2,016,090 | $51,092 | 2,360,860 | $58,175 | 29,038,471 | $721,293 | 29,337,085 | $801,135 |
| Market | 3,234,980 | 56,895 | 2,472,915 | 62,108 | 3,572,020 | 83,371 | 4,796,245 | 99,686 | 3,425,540 | 86,878 | 46,769,467 | 928,155 | 53,595,693 | 1,078,298 |
| Scrod | 195,575 | 2,379 | 121,955 | 1,971 | 330,380 | 5,415 | 462,420 | 7,272 | 215,380 | 4,060 | 2,082,640 | 33,094 | 2,944,710 | 46,513 |
| Cod, salted: | | | | | | | | | | | | | | |
| Large | | | | | | | | | | | | | 6,000 | 255 |
| Market | | | 14,300 | 536 | | | | | | | 14,300 | 536 | 400 | 14 |
| Haddock, fresh: | | | | | | | | | | | | | | |
| Large | 5,406,515 | 143,948 | 4,817,805 | 156,829 | 4,436,140 | 173,512 | 3,831,055 | 162,984 | 4,221,515 | 180,208 | 85,432,330 | 2,464,128 | 96,818,320 | 2,889,068 |
| Scrod | 9,050,285 | 107,076 | 7,372,210 | 82,883 | 3,758,220 | 66,001 | 3,517,781 | 66,899 | 2,419,524 | 56,728 | 43,021,943 | 704,867 | 33,103,115 | 762,164 |
| Hake, fresh: | | | | | | | | | | | | | | |
| Large | 499,685 | 6,060 | 477,600 | 9,842 | 994,910 | 14,227 | 642,295 | 10,830 | 440,485 | 13,453 | 6,551,490 | 156,016 | 8,111,045 | 184,814 |
| Small | 231,700 | 3,858 | 217,550 | 4,794 | 308,670 | 4,924 | 265,310 | 4,743 | 82,170 | 2,604 | 1,550,362 | 30,255 | 1,614,385 | 35,800 |
| Pollock, fresh | 427,210 | 7,227 | 404,680 | 8,327 | 1,188,060 | 19,043 | 4,144,705 | 48,715 | 3,524,495 | 38,579 | 20,363,065 | 288,662 | 16,857,310 | 310,518 |
| Cusk, fresh | 245,727 | 3,788 | 237,570 | 5,085 | 733,085 | 12,465 | 490,530 | 7,810 | 381,705 | 8,065 | 4,311,497 | 84,429 | 5,555,782 | 114,915 |
| Halibut, fresh | 160,602 | 17,395 | 80,855 | 9,738 | 75,930 | 9,183 | 16,105 | 2,629 | 20,770 | 3,762 | 1,438,667 | 174,890 | 1,937,638 | 236,684 |
| Mackerel, fresh | 2,026,365 | 72,531 | 676,960 | 26,402 | 1,046,095 | 43,699 | 200,345 | 11,094 | 1,648,830 | 83,386 | 16,033,695 | 473,523 | 7,485,218 | 377,251 |
| Flounders, fresh: | | | | | | | | | | | | | | |
| Gray sole | 213,650 | 10,345 | 111,935 | 7,704 | 414,095 | 19,871 | 158,595 | 9,594 | 329,025 | 17,680 | 6,322,185 | 239,086 | 6,561,939 | 268,277 |
| Lemon sole | 278,900 | 12,949 | 398,735 | 24,095 | 278,645 | 20,672 | 345,050 | 20,501 | 209,950 | 21,519 | 2,534,029 | 161,038 | 2,436,399 | 150,968 |
| Yellowtail | 127,320 | 3,386 | 107,580 | 2,946 | 462,105 | 9,048 | 361,615 | 8,399 | 479,950 | 10,845 | 3,011,994 | 70,670 | 3,852,180 | 86,702 |
| Blackback | 159,620 | 4,363 | 320,990 | 12,489 | 376,420 | 12,733 | 230,160 | 6,861 | 121,620 | 6,364 | 1,621,405 | 58,097 | 1,032,290 | 37,959 |
| Dab | 154,915 | 4,243 | 149,845 | 4,778 | 178,370 | 4,861 | 66,140 | 1,680 | 88,375 | 1,902 | 2,224,155 | 48,439 | 2,081,135 | 44,401 |
| Other | 18,310 | 554 | 23,415 | 964 | 34,070 | 1,007 | 20,145 | 913 | 18,475 | 767 | 342,628 | 10,932 | 715,639 | 21,220 |
| Swordfish, fresh | 481,517 | 88,054 | 486,388 | 102,146 | 36,267 | 8,256 | | | 56 | 12 | 1,313,507 | 281,471 | 1,090,618 | 225,569 |
| Whiting, fresh | 2,267,645 | 30,528 | 1,172,315 | 15,707 | 254,835 | 3,951 | 50,321 | 937 | 27,075 | 544 | 7,739,402 | 113,815 | 6,213,064 | 100,192 |
| Wolffish, fresh | 27,260 | 704 | 21,865 | 666 | 47,495 | 1,657 | 25,875 | 1,020 | 47,075 | 1,735 | 1,850,590 | 41,851 | 1,838,906 | 42,751 |
| Rosefish, fresh | 3,706,533 | 40,706 | 2,929,380 | 34,364 | 3,468,289 | 41,260 | 1,801,309 | 24,938 | 2,050,568 | 37,107 | 34,141,474 | 442,450 | 41,175,252 | 641,011 |
| Herring, fresh | | | | | | | | | | | | | 1,400 | 18 |
| Other, fresh | 128,487 | 11,815 | 197,649 | 18,864 | 206,825 | 25,001 | 114,766 | 13,825 | 192,888 | 14,358 | 1,035,880 | 95,768 | 234,004 | 11,488 |
| Total, fresh | 30,151,366 | 661,417 | 23,859,607 | 636,031 | 24,103,312 | 640,424 | 23,556,857 | 562,422 | 22,306,331 | 648,731 | 318,730,876 | 7,622,929 | 324,593,127 | 8,467,716 |
| Total, salted | | | 14,300 | 536 | | | | | | | 14,300 | 536 | 6,400 | 269 |
| Grand total | 30,151,366 | 661,417 | 23,873,907 | 636,567 | 24,103,312 | 640,424 | 23,556,857 | 562,422 | 22,306,331 | 648,731 | 318,745,176 | 7,623,465 | 324,599,527 | 8,467,985 |
| Landed in 1937: | | | | | | | | | | | | | | |
| Fresh | 27,224,462 | 723,563 | 26,474,171 | 754,754 | 28,285,456 | 869,036 | 29,335,270 | 844,498 | 22,878,278 | 661,746 | | | 324,593,127 | 8,467,716 |
| Salted | | | | | 6,400 | 269 | | | | | | | 6,400 | 269 |
| Total | 27,224,462 | 723,563 | 26,474,171 | 754,754 | 28,291,856 | 869,305 | 29,335,270 | 844,498 | 22,878,278 | 661,746 | | | 324,599,527 | 8,467,985 |

NOTE.—The weights of fresh and salted fish given in these statistics represent the fish as landed from the vessels, and the values are those received by the fishermen. Large cod are classified as those weighing over 10 pounds; market cod, 2½ to 10 pounds; and scrod cod, 1 to 2½ pounds. Large haddock are those weighing over 2½ pounds and scrod haddock, 1 to 2½ pounds. Large hake are those weighing over 6 pounds and small hake, under 6 pounds. Only landings by vessels having a capacity of 5 net tons or greater are used in this tabulation

GLOUCESTER: BY MONTHS

| Species | January | | February | | March | | April | | May | | June | | July | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod, fresh: | | | | | | | | | | | | | | |
| Large | 178, 166 | $5, 654 | 89, 915 | $3, 346 | 533. 370 | $10, 910 | 1, 034, 402 | $20, 012 | 596. 661 | $11, 615 | 258, 211 | $6, 714 | 182, 530 | $3, 917 |
| Market | 159, 665 | 4, 516 | 84, 115 | 2, 419 | 287, 345 | 5, 572 | 1, 505, 929 | 20, 034 | 1. 014, 701 | 9, 474 | 214, 425 | 2, 423 | 204, 824 | 2, 888 |
| Scrod | 17, 120 | 437 | 7, 020 | 127 | 36, 290 | 646 | 26, 925 | 503 | 34, 535 | 223 | 1, 225 | 13 | 10, 320 | 125 |
| Cod, salted: | | | | | | | | | | | | | | |
| Large | | | | | 23, 750 | 714 | 5, 050 | 99 | 251, 820 | 7, 594 | 33, 445 | 1, 107 | 26, 075 | 838 |
| Market | | | | | 2, 875 | 67 | 830 | 19 | 2, 720 | 36 | 10, 175 | 114 | 265, 401 | 6, 053 |
| Scrod | | | | | | | | | | | 210 | 3 | | |
| Haddock, fresh: | | | | | | | | | | | | | | |
| Large | 184, 668 | 6, 636 | 161, 200 | 5, 083 | 494, 085 | 12, 369 | 890, 455 | 17, 303 | 386, 270 | 6, 758 | 73. 405 | 1, 477 | 124, 156 | 2, 741 |
| Scrod | 32, 725 | 846 | 16, 395 | 331 | 27, 700 | 645 | 125, 875 | 1, 782 | 60, 950 | 872 | 20, 210 | 261 | 132, 295 | 2, 156 |
| Hake, fresh: | | | | | | | | | | | | | | |
| Large | 55, 460 | 1, 438 | 13, 380 | 337 | 46, 935 | 1, 144 | 19, 110 | 276 | 27, 615 | 286 | 14, 440 | 206 | 62, 090 | 789 |
| Small | 15, 340 | 334 | 14, 105 | 440 | 9, 300 | 180 | 13, 375 | 196 | 95, 605 | 969 | 96, 935 | 1, 003 | 89, 535 | 950 |
| Hake, salted, large | | | | | 280 | 7 | | | 960 | 14 | | | | |
| Pollock, fresh | 933, 882 | 12, 548 | 46, 055 | 743 | 125, 495 | 2, 038 | 127, 425 | 1, 540 | 150, 460 | 1, 322 | 86, 644 | 764 | 190, 694 | 2, 134 |
| Pollock, salted | | | | | | | | | | | 170 | 3 | 220 | 3 |
| Cusk, fresh | 1, 540 | 34 | 1, 015 | 19 | 4, 605 | 105 | 1, 945 | 20 | 32, 365 | 325 | 23, 610 | 260 | 52, 815 | 714 |
| Cusk, salted | | | | | | | | | 160 | 2 | | | | |
| Halibut, fresh | 765 | 76 | 7, 995 | 996 | 4, 000 | 406 | 2, 752 | 199 | 43, 138 | 3, 354 | 34, 088 | 1, 810 | 1, 907 | 144 |
| Halibut, salted | | | | | | | | | 4, 935 | 398 | | | | |
| Mackerel, fresh | | | | | | | 54, 000 | 999 | 272, 070 | 3, 877 | 843. 760 | 13, 090 | 2, 204, 485 | 38, 446 |
| Flounders, fresh: | | | | | | | | | | | | | | |
| Gray sole | 41, 615 | 1, 132 | 41, 860 | 1, 244 | 44, 625 | 1, 588 | 29, 070 | 1, 055 | 39, 325 | 833 | 21, 055 | 663 | 40, 560 | 1, 321 |
| Lemon sole | | | | | | | | | 315 | 6 | 50 | 2 | 685 | 18 |
| Yellowtail | 32, 935 | 608 | 4, 895 | 86 | 9, 680 | 191 | 245 | 7 | 5, 165 | 50 | 6, 275 | 100 | 7, 695 | 130 |
| Blackback | 1, 200 | 48 | 650 | 28 | 1, 325 | 61 | 605 | 14 | 1, 570 | 31 | 695 | 16 | 2, 630 | 75 |
| Dab | 4, 185 | 78 | 7, 275 | 91 | 9, 950 | 129 | 30, 280 | 465 | 32, 465 | 293 | 23, 639 | 204 | 14, 780 | 135 |
| Other | | | 580 | 52 | 125 | 11 | 210 | 3 | | | | | | |
| Swordfish, fresh | | | | | | | | | | | 255 | 69 | | |
| Whiting, fresh | | | 700 | 7 | 1, 183 | 30 | 6, 097 | 75 | 23, 046 | 327 | 291, 480 | 3, 948 | 335, 385 | 3, 943 |
| Wolffish, fresh | 7, 395 | 166 | 3, 935 | 111 | 31, 840 | 630 | 21, 015 | 308 | 20, 195 | 249 | 4, 355 | 62 | 3, 680 | 46 |
| Rosefish, fresh | 1, 018, 500 | 13, 462 | 180, 050 | 2, 498 | 860, 694 | 12, 632 | 654, 129 | 8, 942 | 5, 777, 040 | 63, 340 | 4, 124, 305 | 38, 829 | 3, 450, 520 | 35, 405 |
| Other, fresh | 1, 745 | 43 | 4, 833 | 55 | 11, 013 | 1, 052 | 15, 136 | 2, 980 | 18, 572 | 1, 619 | 25, 060 | 2, 054 | 246, 457 | 9, 491 |
| Total, fresh | 2, 686, 906 | 48, 056 | 685, 973 | 18, 013 | 2, 539, 590 | 50, 339 | 4, 458, 980 | 76, 713 | 8, 632, 096 | 105, 823 | 6, 167, 122 | 73, 968 | 7, 358, 043 | 105, 568 |
| Total, salted | | | | | 26, 905 | 788 | 5, 880 | 118 | 260, 595 | 8, 044 | 44, 000 | 1, 257 | 291, 696 | 6, 894 |
| Grand total | 2, 686, 906 | 48, 056 | 685, 973 | 18, 013 | 2, 566, 495 | 51, 127 | 4, 464, 860 | 76, 831 | 8, 892, 691 | 113, 867 | 6, 211, 122 | 75, 225 | 7, 649, 739 | 112, 462 |
| Landed in 1937: | | | | | | | | | | | | | | |
| Fresh | 1, 290, 136 | 28, 978 | 716, 790 | 18, 440 | 719, 623 | 17, 925 | 1, 948, 924 | 37, 363 | 3, 484, 931 | 54, 662 | 4, 622, 952 | 63, 180 | 4, 673, 021 | 75, 753 |
| Salted | 203, 684 | 6, 689 | | | 80, 356 | 2, 412 | 33, 855 | 985 | 13, 025 | 360 | 44, 765 | 1, 229 | 328, 215 | 10, 591 |
| Total | 1, 493, 820 | 35, 667 | 716, 790 | 18, 440 | 799, 979 | 20, 337 | 1, 982, 779 | 38, 348 | 3, 497, 956 | 55, 022 | 4, 667, 717 | 69, 409 | 5, 001, 236 | 86, 344 |

*Landings by fishing vessels at the three principal New England ports, 1938*—Continued

GLOUCESTER: BY MONTHS—Continued

| Species | August | | September | | October | | November | | December | | Total, 1938 | | Total, 1937 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod, fresh: | | | | | | | | | | | | | | |
| Large | 115,410 | $3,005 | 107,435 | $4,694 | 253,210 | $7,814 | 156,041 | $3,904 | 157,655 | $3,672 | 3,663,006 | $85,257 | 3,615,563 | $102,979 |
| Market | 182,385 | 2,645 | 100,055 | 2,300 | 257,564 | 5,676 | 220,820 | 4,136 | 167,885 | 3,513 | 4,299,716 | 65,596 | 4,410,286 | 85,593 |
| Scrod | 415 | 3 | 650 | 7 | 8,070 | 132 | 23,050 | 368 | 23,875 | 414 | 189,495 | 2,998 | 184,945 | 2,931 |
| Cod, salted: | | | | | | | | | | | | | | |
| Large | 607,610 | 18,199 | | | 376,140 | 11,475 | | | 108,000 | 3,240 | 1,431,890 | 43,266 | 923,093 | 30,155 |
| Market | 298,050 | 8,923 | | | 186,190 | 5,404 | | | 55,000 | 1,595 | 821,241 | 22,241 | 327,301 | 9,739 |
| Scrod | | | | | | | | | | | 210 | 3 | 28,628 | 713 |
| Haddock, fresh: | | | | | | | | | | | | | | |
| Large | 224,705 | 4,814 | 57,411 | 1,747 | 151,680 | 5,129 | 29,170 | 1,012 | 67,635 | 2,211 | 2,844,840 | 67,280 | 3,157,101 | 82,594 |
| Scrod | 353,400 | 4,417 | 5,435 | 72 | 28,940 | 466 | 95,380 | 908 | 23,085 | 490 | 922,390 | 13,246 | 1,049,615 | 22,559 |
| Hake, fresh: | | | | | | | | | | | | | | |
| Large | 53,690 | 577 | 282,345 | 4,637 | 293,890 | 3,424 | 138,349 | 2,343 | 88,053 | 2,457 | 1,095,357 | 17,914 | 1,733,028 | 26,915 |
| Small | 136,855 | 1,418 | 64,720 | 891 | 56,835 | 673 | 22,115 | 263 | 21,755 | 416 | 636,475 | 7,733 | 111,022 | 1,644 |
| Hake, salted, large | 320 | 5 | | | | | | | | | 1,560 | 26 | 6,413 | 113 |
| Pollock, fresh | 581,055 | 6,886 | 473,720 | 5,738 | 1,704,961 | 18,777 | 3,163,358 | 31,676 | 1,405,027 | 13,411 | 8,988,776 | 97,577 | 9,614,949 | 145,095 |
| Pollock, salted | | | | | | | | | | | 390 | 6 | 2,130 | 39 |
| Cusk, fresh | 27,660 | 305 | 9,595 | 132 | 53,390 | 792 | 1,820 | 17 | 10,270 | 161 | 220,630 | 2,884 | 300,478 | 4,273 |
| Cusk, salted | | | | | | | | | | | 160 | 2 | 400 | 8 |
| Halibut, fresh | 466 | 45 | 457 | 50 | 966 | 30 | 50 | 5 | 131 | 33 | 96,715 | 7,148 | 40,433 | 3,354 |
| Halibut, salted | | | | | | | | | | | 4,935 | 398 | | |
| Mackerel, fresh | 444,505 | 12,745 | 141,595 | 4,757 | 187,630 | 6,610 | 157,740 | 11,544 | 350,305 | 17,701 | 4,656,090 | 109,769 | 1,262,163 | 71,761 |
| Mackerel, salted | 400 | 14 | | | 49,800 | 3,750 | | | | | 50,200 | 3,764 | 251,170 | 15,513 |
| Flounders, fresh: | | | | | | | | | | | | | | |
| Gray sole | 71,450 | 2,032 | 41,720 | 1,677 | 64,350 | 2,240 | 49,620 | 1,795 | 38,555 | 2,017 | 526,805 | 17,597 | 847,753 | 32,476 |
| Lemon sole | 7,975 | 241 | | | 210 | 11 | 9,600 | 306 | 70 | 6 | 18,935 | 590 | 29,190 | 1,292 |
| Yellowtail | 1,820 | 30 | 1,395 | 24 | 29,610 | 479 | 6,225 | 95 | 2,235 | 39 | 108,175 | 1,839 | 237,135 | 4,371 |
| Blackback | 1,410 | 42 | 550 | 18 | 3,480 | 101 | 2,700 | 60 | 750 | 24 | 17,565 | 518 | 32,740 | 1,214 |
| Dab | 26,988 | 291 | 24,330 | 349 | 21,075 | 353 | 15,035 | 171 | 17,125 | 226 | 230,127 | 2,785 | 300,768 | 4,819 |
| Other | | | | | 110 | 7 | 1,465 | 27 | | | 2,490 | 100 | 8,310 | 656 |
| Swordfish, fresh | 2,289 | 339 | 621 | 125 | | | | | | | 3,165 | 533 | 11,185 | 2,060 |
| Whiting, fresh | 544,628 | 6,826 | 334,092 | 4,236 | 23,265 | 426 | 8,447 | 150 | 900 | 16 | 1,569,223 | 19,984 | 325,653 | 7,174 |
| Wolffish, fresh | 3,195 | 38 | 605 | 7 | 410 | 7 | 65 | 1 | 435 | 9 | 97,125 | 1,634 | 102,415 | 1,663 |
| Rosefish, fresh | 4,666,876 | 47,586 | 3,043,325 | 32,300 | 2,254,830 | 26,038 | 2,120,820 | 28,301 | 1,256,875 | 20,813 | 29,407,964 | 330,146 | 17,022,740 | 245,732 |
| Herring, fresh | | | 1,600 | 10 | 100 | 1 | | | | | 1,700 | 11 | 4,875 | 45 |
| Other, fresh | 512,342 | 22,928 | 232,233 | 7,335 | 5,811 | 180 | 21,719 | 1,080 | 6,835 | 324 | 1,101,786 | 49,141 | 297,489 | 10,528 |
| Total, fresh | 7,959,519 | 117,213 | 4,923,889 | 71,106 | 5,403,387 | 79,366 | 6,243,589 | 88,162 | 3,639,456 | 67,953 | 60,698,550 | 902,280 | 44,699,836 | 861,728 |
| Total, salted | 906,380 | 27,141 | | | 612,130 | 20,629 | | | 163,000 | 4,835 | 2,310,586 | 69,706 | 1,539,135 | 56,280 |
| Grand total | 8,865,899 | 144,354 | 4,923,889 | 71,106 | 6,015,517 | 99,995 | 6,243,589 | 88,162 | 3,802,456 | 72,788 | 63,009,136 | 971,986 | 46,238,971 | 918,008 |
| Landed in 1937: | | | | | | | | | | | | | | |
| Fresh | 4,630,303 | 82,889 | 3,322,597 | 69,899 | 4,317,599 | 102,376 | 9,072,088 | 190,300 | 5,900,872 | 114,963 | | | 44,699,836 | 861,728 |
| Salted | 425,685 | 16,026 | 210,870 | 9,858 | 196,685 | 8,038 | | | 1,995 | 92 | | | 1,539,135 | 56,280 |
| Total | 5,055,988 | 98,915 | 3,533,467 | 79,757 | 4,514,284 | 110,414 | 9,072,088 | 190,300 | 5,902,867 | 115,055 | | | 46,238,971 | 918,008 |

### PORTLAND: By months

| Species | January | | February | | March | | April | | May | | June | | July | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod, fresh: | | | | | | | | | | | | | | |
| Large | 52, 390 | $1, 916 | 45, 386 | $1, 369 | 80, 243 | $2, 034 | 1, 184, 600 | $21, 403 | 506, 971 | $10, 285 | 328, 043 | $8, 931 | 348, 169 | $9, 059 |
| Market | 43, 495 | 1, 138 | 35, 742 | 995 | 57, 654 | 1, 284 | 1, 066, 828 | 18, 753 | 582, 183 | 10, 593 | 38, 284 | 600 | 22, 320 | 359 |
| Scrod | 1, 555 | 24 | 2, 217 | 29 | 2, 370 | 23 | 82, 940 | 1, 411 | 8, 895 | 91 | 7, 885 | 78 | 2, 461 | 18 |
| Haddock, fresh: | | | | | | | | | | | | | | |
| Large | 89, 928 | 4, 400 | 75, 936 | 3, 109 | 84, 924 | 3, 425 | 1, 306, 293 | 22, 831 | 480, 642 | 10, 497 | 73, 611 | 2, 423 | 37, 207 | 1, 469 |
| Scrod | 8, 445 | 200 | 11, 471 | 213 | 6, 694 | 139 | 3, 726 | 43 | 3, 025 | 28 | 4, 995 | 56 | 3, 667 | 43 |
| Hake, fresh: | | | | | | | | | | | | | | |
| Large | 29, 260 | 955 | 11, 715 | 386 | 73, 420 | 2, 382 | 24, 310 | 666 | 68, 322 | 1, 074 | 50, 485 | 683 | 27, 673 | 400 |
| Small | 76, 515 | 2, 531 | 80, 888 | 2, 703 | 29, 735 | 914 | 58, 837 | 1, 298 | 155, 618 | 2, 367 | 219, 711 | 2, 725 | 230, 980 | 3, 047 |
| Pollock, fresh | 38, 920 | 620 | 18, 395 | 288 | 124, 257 | 1, 662 | 131, 797 | 1, 265 | 302, 271 | 2, 398 | 165, 334 | 1, 252 | 83, 485 | 728 |
| Cusk, fresh | 88, 276 | 2, 636 | 212, 542 | 5, 952 | 184, 048 | 4, 408 | 181, 897 | 3, 103 | 170, 435 | 2, 734 | 60, 417 | 1, 157 | 7, 502 | 150 |
| Halibut, fresh | 1, 960 | 369 | 3, 805 | 746 | 2, 992 | 545 | 13, 594 | 1, 696 | 8, 138 | 675 | 1, 117 | 162 | 109 | 15 |
| Mackerel, fresh | | | | | | | | | 650 | 26 | 18, 810 | 727 | | |
| Flounders, fresh: | | | | | | | | | | | | | | |
| Gray sole | 9, 550 | 380 | 11, 875 | 446 | 31, 620 | 1, 559 | 29, 748 | 1, 459 | 82, 735 | 1, 714 | 124, 808 | 3, 088 | 140, 709 | 4, 778 |
| Lemon sole | | | | | | | 2, 085 | 48 | | | 5, 515 | 95 | 5, 690 | 141 |
| Yellowtail | 715 | 14 | 755 | 16 | 1, 215 | 40 | 375 | 6 | 9, 740 | 98 | 1, 625 | 17 | 3, 315 | 50 |
| Blackback | 3, 210 | 108 | 4, 315 | 76 | 2, 360 | 68 | 6, 235 | 183 | 8, 605 | 124 | 3, 079 | 46 | 3, 615 | 63 |
| Dab | 3, 335 | 73 | 3, 920 | 82 | 19, 897 | 432 | 37, 005 | 409 | 26, 737 | 206 | 44, 135 | 451 | 25, 485 | 256 |
| Other | | | | | | | 6, 360 | 322 | 2, 230 | 27 | 592 | 10 | 1, 578 | 17 |
| Swordfish, fresh | | | | | | | | | | | | | 866 | 225 |
| Whiting, fresh | | | | | | | 20 | | 4, 785 | 89 | 66, 381 | 1, 109 | 299, 010 | 2, 302 |
| Wolffish, fresh | 425 | 7 | 555 | 10 | 2, 090 | 28 | 18, 810 | 204 | 5, 255 | 50 | 2, 385 | 19 | 2, 665 | 21 |
| Rosefish, fresh | 110, 130 | 1, 913 | 10, 540 | 142 | 146, 661 | 2, 054 | 43, 320 | 499 | 74, 435 | 865 | 134, 900 | 1, 284 | 401, 150 | 4, 168 |
| Herring, fresh | | | | | 645 | 7 | | | | | | | | |
| Other, fresh | 95 | 3 | 12, 227 | 1, 170 | 59, 213 | 4, 186 | 2, 354 | 157 | 717 | 20 | 3, 522 | 91 | 11, 399 | 161 |
| Total, fresh | 558, 204 | 17, 287 | 542, 284 | 17, 732 | 910, 038 | 25, 190 | 4, 201, 134 | 75, 756 | 2, 502, 389 | 43, 961 | 1, 355, 634 | 25, 004 | 1, 659, 055 | 27, 470 |
| Landed in 1937, fresh | 969, 739 | 32, 827 | 939, 261 | 28, 127 | 995, 057 | 26, 252 | 3, 656, 284 | 69, 177 | 3, 374, 261 | 61, 549 | 1, 196, 702 | 25, 615 | 1, 037, 424 | 25, 448 |

*Landings by fishing vessels at the three principal New England ports, 1938*—Continued

PORTLAND: BY MONTHS—Continued

| Species | August | | September | | October | | November | | December | | Total, 1938 | | Total, 1937 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod, fresh: | | | | | | | | | | | | | | |
| Large | 300, 136 | $8, 892 | 129, 637 | $5, 530 | 114, 962 | $4, 717 | 67, 638 | $2, 265 | 47, 294 | $1, 553 | 3, 205, 529 | $77, 954 | 2, 821, 115 | $86, 962 |
| Market | 36, 021 | 546 | 39, 046 | 680 | 58, 389 | 1, 197 | 50, 701 | 1, 055 | 42, 384 | 752 | 2, 073, 047 | 37, 952 | 2, 999, 130 | 57, 456 |
| Scrod | 2, 140 | 21 | 1, 100 | 10 | 2, 575 | 22 | 860 | 7 | 1, 030 | 9 | 116, 028 | 1, 743 | 21, 199 | 285 |
| Haddock, fresh: | | | | | | | | | | | | | | |
| Large | 57, 397 | 2, 074 | 47, 753 | 2, 117 | 86, 850 | 4, 377 | 119, 011 | 5, 430 | 96, 951 | 4, 197 | 2, 556, 533 | 66, 349 | 2, 933, 748 | 89, 115 |
| Scrod | 6, 755 | 69 | 7, 620 | 144 | 13, 966 | 219 | 16, 730 | 276 | 11, 715 | 206 | 98, 809 | 1, 636 | 113, 370 | 2, 105 |
| Hake, fresh: | | | | | | | | | | | | | | |
| Large | 65, 077 | 742 | 91, 900 | 1, 597 | 80, 849 | 1, 386 | 14, 790 | 316 | 10, 695 | 305 | 548, 496 | 10, 892 | 2, 398, 911 | 50, 132 |
| Small | 241, 504 | 2, 726 | 229, 723 | 3, 491 | 225, 875 | 3, 413 | 225, 785 | 4, 103 | 101, 930 | 3, 049 | 1, 880, 101 | 32, 367 | 223, 035 | 3, 792 |
| Pollock, fresh | 134, 293 | 1, 090 | 375, 741 | 3, 103 | 689, 013 | 7, 037 | 679, 091 | 6, 630 | 151, 361 | 1, 326 | 2, 893, 958 | 27, 399 | 2, 198, 101 | 26, 544 |
| Cusk, fresh | 29, 862 | 570 | 37, 073 | 908 | 45, 999 | 1, 128 | 151, 704 | 2, 725 | 63, 135 | 1, 679 | 1, 232, 890 | 27, 150 | 2, 170, 017 | 49, 180 |
| Halibut, fresh | 305 | 40 | 490 | 44 | 2, 423 | 357 | 1, 437 | 227 | 1, 507 | 312 | 37, 877 | 5, 218 | 32, 292 | 4, 521 |
| Mackerel, fresh | 30, 220 | 871 | 60, 703 | 1, 850 | 1, 613 | 137 | 84, 975 | 1, 659 | | | 196, 971 | 5, 270 | 216, 160 | 8, 466 |
| Flounder, fresh: | | | | | | | | | | | | | | |
| Gray sole | 86, 468 | 3, 154 | 32, 800 | 2, 095 | 24, 730 | 1, 049 | 8, 874 | 605 | 9, 083 | 502 | 593, 000 | 20, 829 | 436, 093 | 14, 379 |
| Lemon sole | 2, 810 | 52 | 160 | 3 | 1, 168 | 21 | 540 | 20 | 20 | 1 | 17, 988 | 381 | 335 | 18 |
| Yellowtail | 2, 830 | 47 | 2, 275 | 37 | 7, 050 | 150 | 620 | 9 | 15, 630 | 277 | 46, 145 | 761 | 54, 370 | 745 |
| Blackback | 6, 849 | 135 | 3, 243 | 60 | 1, 100 | 32 | 120 | 4 | 845 | 31 | 43, 576 | 930 | 41, 394 | 1, 040 |
| Dab | 11, 037 | 137 | 10, 095 | 204 | 7, 835 | 123 | 5, 780 | 94 | 5, 705 | 113 | 200, 966 | 2, 580 | 190, 366 | 2, 205 |
| Other | 13, 001 | 300 | 4, 445 | 136 | 4, 690 | 96 | 1, 170 | 39 | 2, 145 | 74 | 36, 211 | 1, 021 | 2, 830 | 138 |
| Swordfish, fresh | | | 5, 119 | 872 | | | 68 | 12 | | | 6, 053 | 1, 109 | 22, 617 | 3, 833 |
| Whiting, fresh | 1, 037, 111 | 11, 271 | 306, 995 | 3, 764 | 4, 778 | 52 | | | | | 1, 719, 080 | 18, 587 | 85 | 2 |
| Wolffish, fresh | 340 | 1 | 80 | | 845 | 21 | 910 | 9 | 20 | | 34, 380 | 370 | 64, 079 | 635 |
| Rosefish, fresh | 119, 570 | 1, 249 | 46, 095 | 464 | 23, 230 | 282 | 17, 865 | 193 | 26, 995 | 313 | 1, 154, 891 | 13, 426 | 129, 227 | 822 |
| Herring, fresh | | | | | | | 12, 000 | 180 | | | 12, 645 | 187 | 237 | 2 |
| Other, fresh | 23, 987 | 477 | 5, 698 | 152 | 8, 665 | 186 | 23, 728 | 348 | 290 | 10 | 151, 895 | 6, 961 | 52, 801 | 1, 509 |
| Total, fresh | 2, 207, 713 | 34, 464 | 1, 437, 851 | 27, 261 | 1, 406, 605 | 26, 002 | 1, 484, 427 | 26, 206 | 591, 735 | 14, 739 | 18, 857, 069 | 361, 072 | 17, 121, 512 | 403, 886 |
| Landed in 1937, fresh | 940, 817 | 32, 063 | 1, 015, 358 | 26, 533 | 1, 292, 820 | 31, 721 | 1, 100, 403 | 28, 786 | 603, 386 | 15, 785 | | | 17, 121, 512 | 403, 886 |

SUMMARY: BY PORTS

| Species | Boston | | Gloucester | | Portland | | Total, 1938 | | Total, 1937 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod, fresh: | | | | | | | | | | |
| Large | 29, 038, 471 | $721, 293 | 3, 663, 006 | $85, 257 | 3, 205, 529 | $77, 954 | 35, 907, 006 | $884, 504 | 35, 773, 763 | $991, 076 |
| Market | 46, 769, 467 | 928, 155 | 4, 299, 716 | 65, 596 | 2, 073, 047 | 37, 952 | 53, 142, 230 | 1, 031, 703 | 61, 005, 109 | 1, 221, 347 |
| Scrod | 2, 082, 640 | 33, 094 | 189, 495 | 2, 998 | 116, 028 | 1, 743 | 2, 388, 163 | 37, 835 | 3, 150, 854 | 49, 729 |
| Cod, salted: | | | | | | | | | | |
| Large | | | 1, 431, 890 | 43, 266 | | | 1, 431, 890 | 43, 266 | 929, 093 | 30, 410 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Market | 14, 300 | 536 | 821, 241 | 22, 241 | | | 835, 541 | 22, 777 | 327, 701 | 9, 753 |
| Scrod | | | 210 | 3 | | | 210 | 3 | 28, 628 | 713 |
| Haddock, fresh: | | | | | | | | | | |
| Large | 85, 432, 330 | 2, 464, 128 | 2, 844, 840 | 67, 280 | 2, 556, 533 | 66, 349 | 90, 833, 703 | 2, 597, 757 | 102, 909, 169 | 3, 060, 777 |
| Scrod | 43, 021, 943 | 704, 867 | 922, 390 | 13, 246 | 98, 809 | 1, 636 | 44, 043, 142 | 719, 749 | 34, 266, 100 | 786, 828 |
| Hake, fresh: | | | | | | | | | | |
| Large | 6, 551, 490 | 156, 016 | 1, 095, 357 | 17, 914 | 548, 496 | 10, 892 | 8, 195, 343 | 184, 822 | 12, 242, 984 | 261, 861 |
| Small | 1, 550, 362 | 30, 255 | 636, 475 | 7, 733 | 1, 880, 101 | 32, 367 | 4, 066, 938 | 70, 355 | 1, 948, 442 | 41, 236 |
| Hake, salted, large | | | 1, 560 | 26 | | | 1, 560 | 26 | 6, 413 | 113 |
| Pollock, fresh | 20, 363, 065 | 288, 662 | 8, 988, 776 | 97, 577 | 2, 893, 958 | 27, 399 | 32, 245, 799 | 413, 638 | 28, 670, 360 | 482, 157 |
| Pollock, salted | | | 390 | 6 | | | 390 | 6 | 2, 130 | 39 |
| Cusk, fresh | 4, 311, 497 | 84, 429 | 220, 630 | 2, 884 | 1, 232, 890 | 27, 150 | 5, 765, 017 | 114, 463 | 8, 026, 277 | 168, 368 |
| Cusk, salted | | | 160 | 2 | | | 160 | 2 | 400 | 8 |
| Halibut, fresh | 1, 438, 667 | 174, 890 | 96, 715 | 7, 148 | 37, 877 | 5, 218 | 1, 573, 259 | 187, 256 | 2, 010, 363 | 244, 559 |
| Halibut, salted | | | 4, 935 | 398 | | | 4, 935 | 398 | | |
| Mackerel, fresh | 16, 033, 695 | 473, 523 | 4, 656, 090 | 109, 769 | 196, 971 | 5, 270 | 20, 886, 756 | 588, 562 | 8, 963, 541 | 457, 478 |
| Mackerel, salted | | | 50, 200 | 3, 764 | | | 50, 200 | 3, 764 | 251, 170 | 15, 513 |
| Flounders, fresh: | | | | | | | | | | |
| Gray sole | 6, 322, 185 | 239, 086 | 526, 805 | 17, 597 | 593, 000 | 20, 829 | 7, 441, 990 | 277, 512 | 7, 845, 785 | 315, 132 |
| Lemon sole | 2, 534, 029 | 161, 038 | 18, 935 | 590 | 17, 988 | 381 | 2, 570, 952 | 162, 009 | 2, 465, 924 | 152, 278 |
| Yellowtail | 3, 011, 994 | 70, 670 | 108, 175 | 1, 839 | 46, 145 | 761 | 3, 166, 314 | 73, 270 | 4, 143, 685 | 91, 818 |
| Blackback | 1, 621, 405 | 58, 097 | 17, 565 | 518 | 43, 576 | 930 | 1, 682, 546 | 59, 545 | 1, 106, 424 | 40, 213 |
| Dab | 2, 224, 155 | 48, 439 | 230, 127 | 2, 785 | 200, 966 | 2, 580 | 2, 655, 248 | 53, 804 | 2, 572, 269 | 51, 425 |
| Other | 342, 628 | 10, 932 | 2, 490 | 100 | 36, 211 | 1, 021 | 381, 329 | 12, 053 | 726, 779 | 22, 014 |
| Swordfish, fresh | 1, 313, 507 | 281, 471 | 3, 165 | 533 | 6, 053 | 1, 109 | 1, 322, 725 | 283, 113 | 1, 124, 420 | 231, 462 |
| Whiting, fresh | 7, 739, 402 | 113, 815 | 1, 569, 223 | 19, 984 | 1, 719, 080 | 18, 587 | 11, 027, 705 | 152, 386 | 6, 538, 802 | 107, 368 |
| Wolffish, fresh | 1, 850, 590 | 41, 851 | 97, 125 | 1, 634 | 34, 380 | 370 | 1, 982, 095 | 43, 855 | 2, 005, 400 | 45, 049 |
| Rosefish, fresh | 34, 141, 474 | 442, 450 | 29, 407, 964 | 330, 146 | 1, 154, 891 | 13, 426 | 64, 704, 329 | 786, 022 | 58, 327, 219 | 887, 565 |
| Herring, fresh | | | 1, 700 | 11 | 12, 645 | 187 | 14, 345 | 198 | 6, 512 | 65 |
| Other, fresh | 1, 035, 880 | 95, 768 | 1, 101, 786 | 49, 141 | 151, 895 | 6, 961 | [1] 2, 289, 561 | [1] 151, 870 | 584, 294 | 23, 525 |
| Total, fresh | 318, 730, 876 | 7, 622, 929 | 60, 698, 550 | 902, 280 | 18, 857, 069 | 361, 072 | 398, 286, 495 | 8, 886, 281 | 386, 414, 475 | 9, 733, 330 |
| Total, salted | 14, 300 | 536 | 2, 310, 586 | 69, 706 | | | 2, 324, 886 | 70, 242 | 1, 545, 535 | 56, 549 |
| Grand total | 318, 745, 176 | 7, 623, 465 | 63, 009, 136 | 971, 986 | 18, 857, 069 | 361, 072 | 400, 611, 381 | 8, 956, 523 | 387, 960, 010 | 9, 789, 879 |
| Landed in 1937: | | | | | | | | | | |
| Fresh | 324, 593, 127 | 8, 467, 716 | 44, 699, 836 | 861, 728 | 17, 121, 512 | 403, 886 | | | 386, 414, 475 | 9, 733, 330 |
| Salted | 6, 400 | 269 | 1, 539, 135 | 56, 280 | | | | | 1, 545, 535 | 56, 549 |
| Total | 324, 599, 527 | 8, 467, 985 | 46, 238, 971 | 918, 008 | 17, 121, 512 | 403, 886 | | | 387, 960, 010 | 9, 789, 879 |

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[1] The items under "Other, fresh" include alewives, 216,739 pounds, value $1,761; butterfish, 179,813 pounds, value $8,045; eels, 5,873 pounds, value $99; herring smelt, 4,600 pounds, value $146; salmon, 53 pounds, value $13; scup or porgy, 13,725 pounds, value $320; sea bass, 205 pounds, value $14; shad, 31,888 pounds, value $1,513; sharks, 50,994 pounds, value $1,534; skates, 57,575 pounds, value $814; striped bass, 5 pounds; sturgeon, 2,295 pounds, value $182; tautog, 55 pounds, value $2; tuna, 805,101 pounds, value $37,615; mixed fish, 16,725 pounds, value $142; lobsters, 18 pounds, value $2; scallops, 828,886 pounds, value $94,143; shrimp, 73,491 pounds, value $5,489; and squid, 1,520 pounds, value $36.

NOTE.—In addition to the above the following also were landed during 1938: Livers, 4,864,218 pounds, value $137,484; spawn, 348,074 pounds, value $10,314; tongues, 3,149 pounds, value $21.

## BIOLOGICAL ASPECT

In 1938 the fishing fleet landing fares at Boston, Gloucester, and Portland, and operating on the fishing banks of the North Atlantic, numbered 389 steam, motor, and sail vessels of 5 net tons capacity or greater, as measured by the United States Customs Service. The catch of edible fish landed at the three ports amounted to 402,710,099 pounds when the salted fish had been converted to the basis of fresh gutted or round weight as usually landed. This, however, does not represent the entire catch of edible fish of these vessels, for landings were also made at ports in New England other than these three; at New York City, and at more southern ports in connection with the southern winter trawl and mackerel fisheries.

Otter trawls on all sizes of vessels accounted for 319,195,082 pounds, or 79 percent of the total landings. Line trawls were next in importance, accounting for 42,026,955 pounds, or 10 percent of the total.

The catch taken off New England and landed at the three ports amounted to 249,185,412 pounds, or 62 percent of the total; that off Nova Scotia, 145,241,037 pounds, or 36 percent of the total; that off the east coast of Newfoundland, 5,028,681 pounds; and that off the Middle Atlantic States, 3,254,969 pounds; each representing about 1 percent of the total.

*Landings by fishing vessels at the three principal New England ports, 1938*

BY GEAR AND AREA

| Gear and area | Vessels fishing | Trips | Days absent | Cod | | | Haddock | | Hake | | Pollock | Cusk | Halibut |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Large | Market | Scrod | Large | Scrod | Large | Small | | | |
| Line trawls: | *Number* | *Number* | *Number* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Treaty Coast | 2 | 4 | 81 | 845, 500 | 362, 592 | | | | | | | | |
| Magdalen Islands | 2 | 5 | 95 | 1, 639, 700 | 1, 191, 369 | | | | | | | | |
| Gulf of St. Lawrence, unclassified | 3 | 3 | 60 | 6, 783 | 7, 343 | | | | 135 | | | | 108, 484 |
| Grand Bank | 4 | 9 | 175 | 59, 871 | 7, 536 | | | | 6, 397 | 1, 170 | | 1, 028 | 213, 850 |
| St. Pierre Bank | 3 | 3 | 63 | 32, 395 | 4, 704 | | | | 1, 762 | | | 2, 952 | 45, 388 |
| Newfoundland Banks, unclassified | 1 | 2 | 16 | 2, 765 | 436 | | | | 554 | | | 25 | 16, 949 |
| Northeast Cape Breton | 2 | 2 | 36 | 3, 952 | 456 | | | | | | | | 17, 489 |
| Misaine Bank | 1 | 1 | 7 | 330 | 100 | | 60 | | 1, 145 | 3, 600 | | 19, 480 | |
| Banquereau | 3 | 10 | 201 | 47, 310 | 15, 001 | | | | 23, 366 | | | 8, 367 | 280, 099 |
| Canso | 1 | 1 | 26 | 3, 952 | 456 | | | | | | | | 8, 336 |
| Middle Ground | 1 | 1 | 10 | 33, 700 | 11, 800 | | 34, 000 | 800 | | | 600 | 100 | 5, 182 |
| Northeast Sable Island Bank | 3 | 4 | 21 | 79, 400 | 52, 808 | 2, 480 | 39, 010 | 1, 400 | 4, 949 | | 1, 530 | 8, 988 | 5, 021 |
| Horseshoe Ground | 1 | 1 | 15 | 6, 175 | 1, 600 | | 2, 075 | | 13, 200 | | 400 | 7, 500 | 2, 004 |
| Southwest Sable Island Bank | 2 | 2 | 16 | 7, 310 | 3, 500 | 400 | 3, 610 | 250 | 16, 530 | | 230 | 21, 390 | 121 |
| Emerald Bank | 8 | 12 | 113 | 129, 512 | 135, 234 | 1, 200 | 199, 520 | 20, 790 | 38, 680 | | 7, 290 | 75, 795 | 19, 041 |
| Central Nova Scotia | 1 | 1 | 20 | 3, 100 | 1, 900 | | | 250 | 34, 100 | | 150 | 12, 625 | 179 |
| La Have Bank (including Sambro Bank) | 8 | 20 | 234 | 108, 692 | 101, 235 | 11, 186 | 179, 810 | 19, 275 | 53, 516 | 5, 705 | 8, 901 | 111, 912 | 128, 085 |
| Southern Nova Scotia | 15 | 40 | 322 | 203, 503 | 273, 757 | 16, 525 | 642, 720 | 111, 831 | 159, 400 | 1, 265 | 28, 690 | 281, 103 | 4, 333 |
| Browns Bank | 21 | 195 | 1, 850 | 1, 872, 444 | 1, 824, 962 | 51, 315 | 5, 402, 520 | 606, 805 | 779, 360 | 42, 115 | 197, 003 | 1, 386, 156 | 191, 227 |
| Western Nova Scotia | 18 | 65 | 562 | 364, 196 | 535, 727 | 9, 990 | 1, 002, 306 | 194, 799 | 360, 280 | 29, 618 | 50, 674 | 504, 191 | 14, 041 |
| Southern Bay of Fundy | 3 | 4 | 43 | 13, 675 | 12, 545 | | 99, 800 | 8, 700 | 33, 515 | | 400 | 2, 100 | 178 |
| Nova Scotia, unclassified | 6 | 7 | 75 | 54, 699 | 20, 165 | | 64, 950 | 7, 420 | 17, 960 | | 1, 800 | 19, 760 | 48, 093 |
| Eastern Maine | 9 | 32 | 257 | 60, 230 | 43, 095 | 175 | 120, 131 | 9, 625 | 27, 690 | 214, 306 | 12, 669 | 191, 612 | 2, 870 |
| Central Maine | 15 | 104 | 493 | 104, 067 | 63, 951 | 852 | 69, 260 | 6, 418 | 276, 927 | 318, 923 | 17, 271 | 516, 590 | 2, 695 |
| Western Maine | 30 | 319 | 408 | 71, 958 | 44, 145 | 5, 308 | 86, 388 | 5, 152 | 146, 510 | 125, 444 | 22, 268 | 113, 864 | 1, 284 |
| Eastern Massachusetts | 24 | 683 | 1, 362 | 313, 675 | 399, 445 | 61, 225 | 349, 245 | 4, 595 | 55, 850 | 634, 060 | 46, 600 | 90, 180 | 880 |
| Inner Grounds | 36 | 269 | 962 | 303, 444 | 288, 400 | 8, 055 | 957, 227 | 44, 775 | 657, 593 | 330, 202 | 79, 828 | 1, 165, 939 | 8, 777 |
| Western Side South Channel | 16 | 91 | 592 | 872, 680 | 963, 722 | 3, 490 | 2, 219, 725 | 185, 745 | 330, 865 | 5, 570 | 240, 615 | 71, 152 | 10, 120 |
| Eastern Side South Channel | 15 | 45 | 246 | 138, 377 | 142, 155 | 250 | 804, 680 | 23, 830 | 433, 065 | | 34, 070 | 459, 956 | 1, 702 |
| Northern Edge of Georges | 6 | 9 | 59 | 183, 450 | 72, 560 | | 165, 745 | 2, 100 | 48, 540 | | 9, 440 | 94, 430 | 1, 645 |
| Northeast Peak of Georges | 10 | 19 | 161 | 339, 035 | 321, 990 | 150 | 578, 410 | 42, 290 | 21, 685 | | 44, 720 | 39, 005 | 6, 350 |
| Off No Man's Land | 3 | 3 | 15 | 4, 580 | 4, 300 | 50 | 22, 395 | 2, 145 | 1, 900 | 3, 120 | 3, 325 | 45, 268 | 491 |
| Total | [1] 87 | 1, 966 | 8, 596 | 7, 910, 460 | 6, 908, 989 | 172, 651 | 13, 043, 587 | 1, 298, 995 | 3, 545, 474 | 1, 715, 098 | 808, 474 | 5, 251, 468 | 1, 144, 914 |

*Landings by fishing vessels at the three principal New England ports, 1938*—Continued

BY GEAR AND AREA—Continued

| Gear and area | Vessels fishing | Trips | Days absent | Cod | | | Haddock | | Hake | | Pollock | Cusk | Halibut |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Large | Market | Scrod | Large | Scrod | Large | Small | | | |
| | *Number* | *Number* | *Number* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Hand lines: | | | | | | | | | | | | | |
| Eastern Massachusetts | 1 | 1 | 1 | 35 | 70 | | | | | | 30 | | |
| Northern edge of Georges | 1 | 1 | 6 | 25,900 | 21,100 | | 50 | | | | 1,000 | | |
| Total | 2 | 2 | 7 | 25,935 | 21,170 | | 50 | | | | 1,030 | | |
| Harpoons: | | | | | | | | | | | | | |
| Northeast Cape Breton | 13 | 13 | 256 | | | | | | | | | | |
| La Have Bank (including Sambro Bank) | 1 | 1 | 12 | | | | | | | | | | |
| Browns Bank | 21 | 35 | 521 | | | | | | | | | | |
| Western Nova Scotia | 1 | 1 | 3 | | | | | | | | | | |
| Western Maine | 1 | 15 | 15 | | | | | | | | | | |
| Eastern Massachusetts | 1 | 2 | 2 | | | | | | | | | | |
| Western Side South Channel | 2 | 2 | 6 | | | | | | | | | | |
| Eastern Side South Channel | 1 | 1 | 11 | | | | | | | | | | |
| Northern edge of Georges | 23 | 30 | 416 | | | | | | | | | | |
| Northeast peak of Georges | 22 | 37 | 446 | | | | | | | | | | |
| Central Georges | 1 | 1 | 20 | | | | | | | | | | |
| Southeast Georges | 13 | 16 | 136 | | | | | | | | | | |
| Southwest Georges | 15 | 18 | 229 | | | | | | | | | | |
| Lightship Grounds | 11 | 11 | 92 | | | | | | | | | | |
| Off No Man's Land | 1 | 1 | 12 | | | | | | | | | | |
| Southern New England, unclassified | 6 | 6 | 117 | | | | | | | | | | |
| South | 7 | 7 | 116 | | | | | | | | | | |
| Total | [1] 40 | 197 | 2,410 | | | | | | | | | | |
| Otter trawls, large: | | | | | | | | | | | | | |
| Newfoundland Banks, unclassified) | 3 | 5 | 37 | 60,328 | 245,890 | 4,570 | 68,550 | 11,204 | 1,550 | 120 | 2,188 | | 857 |
| Banquereau | 30 | 114 | 1,035 | 2,235,056 | 9,809,592 | 592,288 | 1,383,188 | 559,739 | 13,242 | 970 | 262,296 | 662 | 15,738 |
| Canso | 1 | 2 | 12 | 3,925 | 4,800 | | 86,875 | 6,000 | 6,835 | | 4,350 | 1,050 | 1,448 |
| Middle Ground | 23 | 48 | 341 | 723,131 | 1,397,429 | 117,037 | 1,117,482 | 220,810 | 19,883 | 400 | 198,558 | 1,903 | 9,652 |
| Northeast Sable Island Bank | 27 | 70 | 507 | 1,484,772 | 3,459,113 | 35,605 | 1,828,488 | 602,970 | 40,075 | 2,900 | 362,896 | 1,205 | 11,544 |
| Southeast Sable Island Bank | 14 | 18 | 114 | 258,919 | 593,285 | 680 | 406,190 | 253,144 | 14,366 | 3,100 | 94,928 | 4,502 | 7,111 |
| Horseshoe Grounds | 41 | 201 | 1,362 | 2,659,128 | 2,804,697 | 86,106 | 6,115,760 | 641,700 | 294,066 | 994 | 1,970,055 | 25,290 | 53,999 |
| Southwest Sable Island Bank | 37 | 112 | 877 | 4,111,474 | 4,573,019 | 94,860 | 4,395,769 | 431,936 | 59,370 | 9,193 | 1,388,691 | 3,639 | 55,548 |
| Eastern Nova Scotia | 3 | 4 | 22 | 35,750 | 30,950 | 226 | 16,428 | 3,708 | 2,910 | | 21,120 | | 243 |
| Emerald Bank | 39 | 183 | 1,075 | 2,250,907 | 3,222,975 | 77,381 | 7,094,503 | 761,597 | 109,380 | 281 | 2,097,093 | 23,844 | 38,677 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| La Have Bank (including Sambro Bank) | 7 | 8 | 32 | 36,269 | 69,366 | 2,720 | 234,048 | 26,580 | 6,760 | | 28,853 | 1,490 | 2,027 |
| Southern Nova Scotia | 18 | 54 | 261 | 73,615 | 84,595 | 1,780 | 111,970 | 47,030 | 20,270 | 1,450 | 59,370 | 220 | 136 |
| Browns Bank | 40 | 267 | 1,697 | 1,430,423 | 2,180,306 | 44,826 | 11,089,319 | 2,815,783 | 111,423 | 5,467 | 1,564,427 | 37,239 | 60,600 |
| Western Nova Scotia | 4 | 4 | 33 | 41,500 | 40,500 | | 186,500 | 14,000 | 4,500 | 3,000 | 10,075 | | 1,105 |
| Nova Scotia, unclassified | 16 | 27 | 203 | 365,879 | 484,232 | 16,663 | 748,237 | 185,557 | 29,210 | | 168,942 | 2,075 | 6,981 |
| Central Maine | 1 | 1 | 1 | | | | | | | | | | |
| Western Maine | 3 | 3 | 36 | 150,770 | 95,700 | 26,500 | 265,430 | | 190 | 400 | 58,800 | | 1,970 |
| Eastern Massachusetts | 2 | 2 | 10 | | | | | | | | 89,100 | | |
| Inner Grounds | 11 | 30 | 145 | 37,840 | 46,180 | 220 | 160,346 | 69,400 | 16,490 | 939 | 165,763 | 4,094 | 240 |
| Western Side South Channel | 33 | 238 | 1,352 | 542,560 | 1,236,956 | 38,649 | 2,855,149 | 3,925,243 | 435,889 | 3,053 | 744,443 | 46,695 | 6,782 |
| Eastern Side South Channel | 33 | 217 | 1,169 | 609,552 | 973,340 | 36,813 | 3,353,154 | 2,076,859 | 467,432 | | 1,240,890 | 26,423 | 13,571 |
| Northern edge of Georges | 36 | 257 | 1,555 | 1,238,461 | 4,326,928 | 279,062 | 5,030,228 | 5,488,412 | 193,121 | 3,227 | 1,052,594 | 29,682 | 35,342 |
| Northeast peak of Georges | 42 | 453 | 3,307 | 4,485,010 | 6,566,880 | 493,665 | 12,705,078 | 14,167,388 | 314,047 | 8,755 | 2,917,173 | 66,191 | 53,200 |
| Central Georges | 31 | 98 | 553 | 412,013 | 527,440 | 42,605 | 2,054,947 | 2,483,975 | 42,972 | 845 | 190,877 | 4,042 | 9,214 |
| Southeast Georges | 31 | 104 | 804 | 1,638,230 | 1,001,671 | 12,267 | 3,942,342 | 1,724,151 | 50,130 | 1,290 | 371,645 | 2,974 | 22,833 |
| Southwest Georges | 11 | 13 | 73 | 52,498 | 59,282 | 210 | 453,772 | 196,480 | 9,504 | | 23,765 | 40 | 1,291 |
| Lightship Grounds | 6 | 6 | 40 | 14,964 | 42,672 | 1,564 | 89,167 | 128,374 | 5,875 | 1,512 | 4,401 | 225 | |
| Nantucket Shoals | 4 | 5 | 15 | 9,108 | 22,954 | 2,003 | 45,844 | 61,018 | 4,090 | 189 | 2,314 | 30 | 44 |
| Southern New England, unclassified | 15 | 24 | 168 | 155,816 | 199,925 | 11,530 | 425,256 | 225,585 | 31,650 | | 245,318 | 6,805 | 2,434 |
| Total | [1] 68 | 2,568 | 16,836 | 25,117,898 | 44,100,677 | 2,020,130 | 66,263,820 | 37,128,643 | 2,305,230 | 47,185 | 15,340,925 | 290,320 | 412,587 |
| Otter trawls, medium: | | | | | | | | | | | | | |
| Southwest Sable Island Bank | 1 | 1 | 9 | 3,455 | 1,935 | | 44,150 | 10,080 | 500 | 290 | 410 | 20 | |
| Emerald Bank | 1 | 1 | 8 | 100 | 200 | | 9,000 | 31,400 | | | | | |
| Southern Nova Scotia | 19 | 53 | 386 | 103,773 | 81,470 | 6,358 | 177,090 | 73,517 | 58,377 | 23,555 | 17,107 | 60,956 | 46 |
| Browns Bank | 26 | 162 | 1,257 | 376,031 | 195,155 | 12,555 | 925,597 | 251,615 | 50,978 | 44,047 | 83,800 | 8,080 | 2,471 |
| Western Nova Scotia | 1 | 2 | 12 | 3,870 | 4,325 | 520 | 9,045 | 1,690 | | 3,910 | 925 | | |
| Eastern Maine | 10 | 30 | 185 | 7,903 | 2,600 | 5 | 9,249 | 3,880 | 2,600 | 136,257 | 7,083 | 537 | 120 |
| Central Maine | 13 | 40 | 194 | 18,170 | 8,718 | | 24,692 | 8,175 | 141,695 | 13,060 | 29,380 | 8,995 | 100 |
| Western Maine | 12 | 60 | 237 | 20,240 | 9,428 | 125 | 34,585 | 6,820 | 49,315 | 18,900 | 2,405 | 1,025 | 142 |
| Eastern Massachusetts | 34 | 157 | 608 | 34,685 | 33,980 | 3,475 | 40,290 | 40,360 | 96,100 | 65,950 | 3,235,490 | 3,935 | 58 |
| Inner Grounds | 33 | 125 | 675 | 64,312 | 43,622 | 1,190 | 75,947 | 27,481 | 33,145 | 75,450 | 202,545 | 40,188 | 390 |
| Western Side South Channel | 43 | 332 | 2,127 | 405,865 | 501,857 | 13,267 | 1,513,440 | 1,090,637 | 204,915 | 160,764 | 191,453 | 29,836 | 3,644 |
| Eastern Side South Channel | 30 | 181 | 1,181 | 263,179 | 308,973 | 1,275 | 3,004,029 | 1,237,527 | 169,202 | 17,497 | 142,138 | 6,168 | 5,579 |
| Northern Edge of Georges | 15 | 43 | 239 | 77,880 | 137,425 | 50 | 585,765 | 544,093 | 2,906 | | 13,596 | | 1,527 |
| Northeast Peak of Georges | 6 | 25 | 157 | 334,935 | 258,355 | | 403,584 | 303,270 | 3,240 | | 23,890 | 140 | 1,338 |
| Central Georges | 15 | 87 | 593 | 399,343 | 300,195 | 7,880 | 1,281,895 | 1,123,310 | 7,105 | 1,100 | 77,855 | | 4,198 |
| Southeast Georges | 5 | 14 | 77 | 159,150 | 56,920 | | 226,380 | 106,040 | 7,362 | | 13,302 | 200 | 489 |
| Southwest Georges | 9 | 28 | 179 | 20,380 | 72,267 | | 718,355 | 276,430 | 1,500 | | 6,270 | 150 | 2,891 |
| Lightship Grounds | 7 | 7 | 27 | 2,950 | 14,370 | | 137,310 | 17,620 | 9,575 | | 3,400 | | 63 |
| Nantucket Shoals | 2 | 2 | 17 | 1,920 | 11,260 | 1,500 | 33,200 | 14,650 | 1,800 | | 2,480 | | |
| Off No Man's Land | 4 | 7 | 30 | | 165 | | | 400 | 1,325 | | | | |
| Southern Massachusetts | 1 | 1 | 3 | | 65 | | | | 100 | | | | |
| Southern New England, unclassified | 6 | 7 | 37 | 10,555 | 25,975 | | 67,645 | 56,050 | 1,330 | | 1,566 | | 88 |
| South | 6 | 6 | 22 | 2,240 | 1,410 | | 23,520 | 40,610 | 150 | 645 | 1,255 | | |
| Total | [1] 85 | 1,371 | 8,260 | 2,310,936 | 2,070,670 | 48,200 | 9,344,768 | 5,265,655 | 843,220 | 561,425 | 4,056,350 | 160,230 | 23,144 |

See footnotes at end of table.

### *Landings by fishing vessels at the three principal New England ports, 1938*—Continued

BY GEAR AND AREA—Continued

| Gear and area | Vessels fishing | Trips | Days absent | Cod |  |  | Haddock |  | Hake |  | Pollock | Cusk | Halibut |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Large | Market | Scrod | Large | Scrod | Large | Small |  |  |  |
| Otter trawls, small: | *Number* | *Number* | *Number* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Misaine Bank | 3 | 3 | 17 | 11, 800 | 8, 320 |  | 10, 530 | 270 |  | 510 | 280 |  |  |
| Southern Nova Scotia | 1 | 1 | 4 |  |  |  |  |  | 100 |  |  |  |  |
| Browns Bank | 1 | 1 | 7 | 685 | 335 |  | 265 |  |  | 6, 825 | 30 | 10, 740 |  |
| Western Nova Scotia | 1 | 1 | 3 |  |  |  |  |  |  |  |  |  |  |
| Northern Bay of Fundy | 2 | 2 | 13 | 1, 035 | 140 |  | 1, 135 | 20 |  | 1, 475 | 910 |  |  |
| Eastern Maine | 12 | 77 | 451 | 26, 005 | 14, 272 | 195 | 39, 439 | 7, 690 | 36, 490 | 233, 266 | 5, 440 | 3, 290 | 29 |
| Central Maine | 18 | 142 | 622 | 80, 575 | 51, 827 | 1, 295 | 100, 888 | 8, 565 | 67, 030 | 134, 995 | 4, 560 | 16, 776 | 312 |
| Central Maine (occasional) |  |  |  |  |  |  | 7 |  | 4, 300 | 25 |  |  |  |
| Western Maine | 38 | 459 | 1, 010 | 91, 527 | 70, 784 | 11, 185 | 106, 299 | 17, 210 | 80, 615 | 216, 301 | 6, 960 | 7, 196 | 514 |
| Eastern Massachusetts | 46 | 1, 389 | 4, 368 | 396, 655 | 462, 523 | 70, 688 | 571, 875 | 192, 484 | 104, 760 | 527, 887 | 916, 425 | 2, 230 | 487 |
| Inner Grounds | 12 | 14 | 41 | 4, 135 | 2, 410 | 300 | 3, 875 | 675 | 4, 000 | 7, 745 | 62, 665 | 1, 000 |  |
| Western Side South Channel | 37 | 171 | 557 | 114, 130 | 212, 135 | 27, 985 | 314, 275 | 92, 580 | 56, 995 | 21, 445 | 43, 760 | 800 | 17 |
| Eastern Side South Channel | 7 | 8 | 45 | 2, 885 | 10, 100 | 540 | 44, 490 | 9, 125 |  | 160 | 725 |  | 264 |
| Central Georges | 3 | 4 | 29 | 714 | 5, 200 |  | 7, 600 | 100 | 5, 900 |  | 280 |  | 70 |
| Southwest Georges | 4 | 4 | 17 | 3, 200 | 2, 475 |  | 22, 450 | 8, 550 |  |  |  |  |  |
| Lightship Grounds | 4 | 6 | 28 | 1, 056 | 4, 445 |  |  | 400 |  | 180 |  |  |  |
| Nantucket Shoals | 3 | 5 | 22 |  | 750 | 35 | 185 |  | 1, 205 | 25 | 105 |  |  |
| Off No Man's Land | 5 | 14 | 50 | 30 | 715 |  | 90 | 100 | 3, 085 |  | 50 |  | 135 |
| Southern Massachusetts | 5 | 8 | 31 | 1, 495 | 305 |  | 2, 525 | 1, 075 | 405 |  | 300 |  |  |
| Total | [1] 97 | 2, 309 | 7, 315 | 735, 927 | 846, 736 | 112, 223 | 1, 225, 928 | 338, 844 | 364, 885 | 1, 150, 839 | 1, 042, 490 | 42, 032 | 1, 828 |
| Sink gill nets: |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Browns Bank | 1 | 1 | 6 | 725 | 175 |  | 115 | 500 |  |  |  |  |  |
| Eastern Maine | 1 | 1 | 1 | 2, 000 |  |  |  |  |  | 500 |  |  |  |
| Central Maine | 13 | 552 | 554 | 480, 619 | 64, 354 | 3, 620 | 61, 282 | 2, 285 | 66, 243 | 225, 452 | 1, 071, 781 | 3, 283 | 39 |
| Western Maine | 15 | 1, 480 | 1, 482 | 911, 973 | 164, 035 | 25, 715 | 342, 944 | 6, 730 | 190, 293 | 321, 069 | 1, 632, 994 | 14, 508 | 152 |
| Eastern Massachusetts | 24 | 3, 100 | 3, 104 | 1, 109, 553 | 566, 358 | 6, 030 | 493, 974 | 1, 195 | 874, 352 | 42, 535 | 7, 780, 093 | 3, 255 | 165 |
| Inner Grounds | 10 | 112 | 112 | 21, 420 | 19, 605 |  | 56, 535 | 95 | 7, 185 | 1, 335 | 294, 205 | 225 |  |
| Total | [1] 48 | 5, 246 | 5, 259 | 2, 526, 290 | 814, 527 | 35, 365 | 954, 850 | 10, 805 | 1, 138, 073 | 590, 891 | 10, 779, 073 | 21, 271 | 356 |
| Drift gill nets: |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Western Maine | 2 | 20 | 20 | 50 | 55 | 10 |  |  | 325 |  |  |  |  |
| Eastern Massachusetts | 25 | 199 | 411 |  | 75 |  |  |  | 1, 100 |  | 800 |  |  |
| Inner Grounds | 1 | 1 | 3 |  |  |  |  |  |  |  |  |  |  |
| Western Side South Channel | 4 | 5 | 14 | 100 | 100 |  | 300 |  |  | 1, 500 | 200 |  |  |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off No Man's Land | 3 | 3 | 10 | | | | | | | | | | |
| South | 3 | 3 | 13 | | | | | | | | | | |
| Total | [1] 31 | 231 | 471 | [2] 150 | [2] 230 | [2] 10 | [2] 300 | | [2] 1,425 | [2] 1,500 | [2] 1,000 | | |
| Purse seines: | | | | | | | | | | | | | |
| Canso | 2 | 2 | 16 | | | | | | | | | | |
| Eastern Nova Scotia | 4 | 4 | 27 | | | | | | | | | | |
| Central Nova Scotia | 4 | 4 | 21 | | | | | | | | | | |
| Eastern Maine | 1 | 1 | 1 | | | | | | | | | | |
| Central Maine | 8 | 25 | 69 | | | | | | | | 186,429 | | |
| Western Maine | 7 | 13 | 24 | | | | | | | | 6,600 | | |
| Eastern Massachusetts | 42 | 686 | 1,888 | | 180 | | | | | | 24,169 | | |
| Inner Grounds | 2 | 2 | 6 | | | | | | | | | | |
| Western Side South Channel | 34 | 223 | 796 | | | | 400 | 200 | | | | | 300 |
| Eastern Side South Channel | 1 | 1 | 3 | | | | | | | | | | |
| Southwest Georges | 1 | 1 | 3 | | | | | | | | | | |
| Lightship Grounds | 2 | 2 | 6 | | | | | | | | | | |
| Off No Man's Land | 29 | 81 | 289 | | | | | | | | | | |
| Rhode Island Shore | 3 | 3 | 7 | | | | | | | | | | |
| South | 31 | 80 | 351 | | | | | | | | | | |
| Total | [1] 71 | 1,128 | 3,507 | | [2] 180 | | [2] 400 | [2] 200 | | | [2] 217,198 | | [2] 300 |
| Scallop drags: | | | | | | | | | | | | | |
| Western Side South Channel | 6 | 10 | 94 | | | | | | | | | | |
| Eastern Side South Channel | 14 | 23 | 223 | | | | | | | | | | |
| Northern Edge of Georges | 10 | 23 | 212 | | | | | | | | | | |
| Northeast Peak of Georges | 2 | 4 | 24 | | | | | | | | | | |
| Central Georges | 1 | 1 | 3 | | | | | | | | | | |
| Southwest Georges | 1 | 1 | 8 | | | | | | | | | | |
| Lightship Grounds | 4 | 4 | 38 | | | | | | | | | | |
| Total | [1] 19 | 66 | 602 | | | | | | | | | | |
| Grand total | [1] 389 | 15,084 | 53,263 | 38,627,596 | 54,763,179 | 2,388,579 | 90,833,703 | 44,043,142 | 8,198,307 | 4,066,938 | 32,246,540 | 5,765,321 | 1,583,129 |

[1] Exclusive of duplication.

[2] Incidental catch.

NOTE.—The three principal New England ports are Boston and Gloucester, Mass., and Portland, Maine. Otter trawls are classified according to the size of the vessel. The weight of salted fish landed has been converted to the equivalent of fresh fish as landed. Only landings by vessels having a capacity of 5 net tons or greater are used in this tabulation. "Occasional" after the name of a bank or area indicates that the vessels contributing to the catch as shown fished chiefly with another type of gear. In such cases the number of vessels fishing, number of trips, and number of days absent, are shown under the principal type of gear used. The statistics of landings shown in this bulletin do not correspond exactly with the total of the monthly bulletins since some of the monthly figures have been revised.

## *Landings by fishing vessels at the three principal New England ports, 1938*—Continued

### BY GEAR AND AREA—Continued

| Gear and area | Mackerel | Flounders |  |  |  |  |  | Swordfish | Whiting | Wolffish | Rosefish | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Gray sole | Lemon sole | Yellowtail | Blackback | Dab | Other |  |  |  |  |  |  |
|  | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Line trawls: |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Treaty Coast |  |  |  |  |  |  |  |  |  |  |  |  | 1, 208, 092 |
| Magdalen Islands |  |  |  |  |  |  |  |  |  |  |  |  | 2, 831, 069 |
| Gulf of St. Lawrence, unclassified |  |  |  |  |  |  |  |  |  |  |  |  | 122, 745 |
| Grand Bank |  |  |  |  |  |  |  |  |  |  |  |  | 289, 852 |
| St. Pierre Bank |  |  |  |  |  |  |  |  |  |  |  |  | 87, 201 |
| Newfoundland Banks, unclassified |  |  |  |  |  |  |  |  |  |  |  |  | 20, 729 |
| Northeast Cape Breton |  |  |  |  |  |  |  |  |  |  |  |  | 21, 897 |
| Misaine Bank |  |  |  |  |  |  |  |  |  |  |  |  | 24, 715 |
| Banquereau |  |  |  |  |  |  |  | 840 |  |  |  |  | 374, 983 |
| Canso |  |  |  |  |  |  |  |  |  |  |  |  | 12, 744 |
| Middle Ground |  |  |  |  |  |  |  |  |  | 400 |  |  | 86, 582 |
| Northeast Sable Island Bank |  |  |  |  |  |  |  |  |  | 736 |  |  | 196, 322 |
| Horseshoe Ground |  |  |  |  |  |  |  |  |  |  |  |  | 32, 954 |
| Southwest Sable Island Bank |  |  |  |  |  |  |  |  |  | 35 |  |  | 53, 376 |
| Emerald Bank |  |  |  |  |  |  |  | 382 |  | 1, 858 |  |  | 629, 302 |
| Central Nova Scotia |  |  |  |  |  |  |  |  |  |  |  |  | 52, 304 |
| La Have Bank (including Sambro Bank) |  |  |  |  |  |  |  | 3, 728 |  | 3, 264 |  |  | 735, 309 |
| Southern Nova Scotia |  |  |  |  |  |  |  | 56 |  | 16, 968 |  |  | 1, 740, 151 |
| Browns Bank |  |  |  |  |  |  |  | 1, 504 |  | 54, 380 | 525 |  | 12, 410, 316 |
| Western Nova Scotia | 1, 500 |  |  |  |  |  |  | 68 |  | 13, 150 |  | 6, 032 | 3, 086, 572 |
| Southern Bay of Fundy |  |  |  |  |  |  |  |  |  |  |  |  | 170, 913 |
| Nova Scotia, unclassified |  |  |  |  |  |  |  |  |  | 60 |  |  | 234, 907 |
| Eastern Maine |  | 2, 695 |  | 5, 990 | 1, 350 | 1, 145 | 340 |  |  | 800 |  | 10 | 694, 733 |
| Central Maine |  |  |  |  | 15 | 75 |  |  |  | 135 | 72 | 203 | 1, 377, 454 |
| Western Maine | 650 | 24, 430 |  |  | 45 | 3, 265 |  |  | 1, 713 | 950 | 19, 565 | 434 | 673, 373 |
| Eastern Massachusetts |  | 300 | 500 | 9, 300 | 3, 000 | 5, 180 |  |  | 9, 000 | 16, 775 | 345 | 3, 308 | 2, 003, 463 |
| Inner Grounds |  |  |  |  |  | 172 |  |  |  | 1, 182 |  | 258 | 3, 845, 852 |
| Western Side South Channel |  |  |  |  |  |  |  |  |  | 4, 508 |  |  | 4, 908, 192 |
| Eastern Side South Channel |  |  |  |  |  |  |  |  |  | 279 |  |  | 2, 038, 364 |
| Northern Edge of Georges |  |  |  |  |  |  |  |  |  | 400 |  |  | 578, 310 |
| Northeast Peak of Georges |  |  |  |  |  |  |  |  | 1, 500 | 1, 380 |  |  | 1, 396, 515 |
| Off No Man's Land |  |  |  |  |  |  |  |  |  | 90 |  |  | 87, 664 |
| Total | [2] 2, 150 | 27, 425 | 500 | 15, 290 | 4, 410 | 9, 837 | 340 | [2] 6, 578 | 12, 213 | 117, 350 | 20, 507 | 10, 245 | 42, 026, 955 |
| Hand Lines: |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Eastern Massachusetts |  |  |  |  |  |  |  |  |  |  |  |  | 135 |
| Northern Edge of Georges |  |  |  |  |  |  |  |  |  |  |  |  | 48, 050 |
| Total |  |  |  |  |  |  |  |  |  |  |  |  | 48, 185 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Harpoons:** | | | | | | | | | | | | | |
| Newfoundland Banks, unclassified | | | | | | | | 547 | | | | | 547 |
| Northeast Cape Breton | | | | | | | | 95, 146 | | | | | 95, 146 |
| Banquereau (occasional) | | | | | | | | 546 | | | | | 546 |
| La Have Bank (including Sambro Bank) | | | | | | | | 5, 212 | | | | | 5, 212 |
| La Have Bank (including Sambro Bank, occasional) | | | | | | | | 2, 313 | | | | | 2, 313 |
| Browns Bank | | | | | | | | 289, 000 | | | | | 289, 000 |
| Browns Bank (occasional) | | | | | | | | 4, 884 | | | | | 4, 884 |
| Western Nova Scotia | | | | | | | | 866 | | | | | 866 |
| Western Maine | | | | | | | | | | | | 7, 332 | 7, 332 |
| Eastern Massachusetts | | | | | | | | | | | | 849 | 849 |
| Western Side South Channel | | | | | | | | 5, 304 | | | | | 5, 304 |
| Western Side South Channel (occasional) | | | | | | | | 639 | | | | | 639 |
| Eastern Side South Channel | | | | | | | | 2, 650 | | | | | 2, 650 |
| Eastern Side South Channel (occasional) | | | | | | | | 503 | | | | | 503 |
| Northern Edge of Georges | | | | | | | | 285, 398 | | | | | 285, 398 |
| Northeast Peak of Georges | | | | | | | | 338, 928 | | | | | 338, 928 |
| Northeast Peak of Georges (occasional) | | | | | | | | 182 | | | | | 182 |
| Central Georges | | | | | | | | 5, 119 | | | | | 5, 119 |
| Southeast Georges | | | | | | | | 88, 316 | | | | | 88, 316 |
| Southwest Georges | | | | | | | | 110, 985 | | | | | 110, 985 |
| Lightship Grounds | | | | | | | | 34, 992 | | | | | 34, 992 |
| Off No Man's Land | | | | | | | | 1, 510 | | | | | 1, 510 |
| Southern New England, unclassified | | | | | | | | 18, 536 | | | | | 18, 536 |
| South | | | | | | | | 23, 569 | | | | | 23, 569 |
| Total | | | | | | | | 1, 315, 145 | | | | 8, 181 | 1, 323, 326 |
| **Otter trawls, large:** | | | | | | | | | | | | | |
| Newfoundland Banks, unclassified | 1, 500 | | | 4, 053 | | | | | | 406 | | | 401, 216 |
| Banquereau | 1, 870 | 10, 674 | 4, 655 | 129, 048 | 5, 360 | 21, 150 | 3, 028 | | | 23, 558 | 149, 595 | 920 | 15, 222, 629 |
| Canso | | 54, 750 | | | | 250 | | | | 1, 450 | | 70 | 171, 803 |
| Middle Ground | | 158, 132 | 14, 024 | 127, 595 | | 21, 045 | 2, 050 | | | 28, 311 | 35, 340 | 70 | 4, 192, 852 |
| Northeast Sable Island Bank | 40 | 43, 934 | 10, 129 | 47, 465 | 750 | 22, 155 | | | | 56, 140 | 20, 460 | 100 | 8, 029, 841 |
| Southeast Sable Island Bank | | 8, 342 | 7, 700 | 346 | | 9, 095 | | | | 16, 232 | 19, 025 | | 1, 696, 965 |
| Horseshoe Grounds | 2, 000 | 2, 484, 371 | 60, 864 | 195, 038 | 1, 770 | 34, 059 | 53, 832 | | | 151, 736 | 94, 207 | 2, 290 | 17, 732, 062 |
| Southwest Sable Island Bank | | 82, 139 | 10, 148 | 16, 049 | 600 | 19, 216 | 4, 310 | | | 322, 330 | 8, 137 | 1, 360 | 15, 587, 788 |
| Eastern Nova Scotia | | 120, 350 | | | | 400 | | | | 1, 210 | | | 233, 295 |
| Emerald Bank | 200 | 67, 712 | 36, 522 | 81, 423 | 596 | 26, 248 | 27, 300 | | | 200, 840 | 13, 778 | 1, 110 | 16, 132, 367 |
| La Have Bank (including Sambro Bank) | | 18, 204 | | 10 | 15 | 1, 390 | 50 | | | 7, 184 | 12, 500 | | 447, 466 |
| Southern Nova Scotia | | 25, 483 | 3, 128 | 6, 775 | 228 | 7, 620 | 1, 900 | | 62, 283 | 2, 175 | 3, 030, 765 | 120 | 3, 540, 913 |
| Browns Bank | 170 | 92, 648 | 34, 386 | 25, 576 | 6, 091 | 88, 129 | 4, 165 | | 62, 552 | 350, 256 | 3, 858, 328 | 668 | 23, 862, 782 |
| Western Nova Scotia | | 32, 000 | | | 400 | 100 | | | | 4, 100 | 135, 545 | | 473, 325 |
| Nova Scotia, unclassified | 40 | 34, 625 | 1, 961 | 11, 172 | | 16, 769 | 11, 600 | | | 32, 880 | 12, 900 | | 2, 129, 723 |
| Central Maine | | | | | | | | | | | 2, 750 | | 2, 750 |
| Western Maine | | 775 | | | | | | | | 16, 200 | | | 616, 735 |
| Eastern Massachusetts | | | | | | | | | | | | | 89, 100 |
| Inner Grounds | | 14, 234 | 3, 940 | 2, 112 | 2, 785 | 3, 423 | 1, 720 | | | 999 | 1, 780, 067 | | 2, 310, 792 |
| Western Side South Channel | 400 | 140, 784 | 394, 427 | 20, 086 | 601, 297 | 38, 726 | 13, 260 | | 4, 055 | 47, 599 | 6, 727, 622 | 1, 864 | 17, 825, 539 |
| Eastern Side South Channel | 80 | 196, 414 | 138, 975 | 22, 655 | 50, 498 | 485, 545 | 13, 125 | | 6, 910 | 69, 395 | 4, 861, 125 | 11, 706 | 14, 654, 462 |

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[2] Incidental catch.

*Landings by fishing vessels at the three principal New England ports, 1938*—Continued

BY GEAR AND AREA—Continued

| Gear and area | Mackerel | Flounders |  |  |  |  |  | Swordfish | Whiting | Wolffish | Rosefish | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Gray sole | Lemon sole | Yellowtail | Blackback | Dab | Other |  |  |  |  |  |  |
| Otter trawls, large—Continued. | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Northern Edge of Georges | 632 | 65, 209 | 336, 956 | 76, 366 | 62, 408 | 150, 423 | 16, 660 |  | 6, 302 | 83, 416 | 267, 990 | 10, 651 | 18, 754, 070 |
| Northeast Peak of Georges | 10, 518 | 57, 461 | 328, 995 | 72, 621 | 33, 157 | 46, 272 | 18, 218 | 129 | 3, 539 | 158, 021 | 175, 055 | 11, 931 | 42, 693, 304 |
| Central Georges | 220 | 19, 699 | 268, 960 | 124, 999 | 61, 089 | 17, 125 | 7, 390 |  | 600 | 18, 290 | 36, 074 | 1, 924 | 6, 325, 300 |
| Southeast Georges | 25 | 33, 330 | 47, 933 | 26, 380 | 1, 577 | 22, 527 | 4, 835 |  |  | 28, 949 | 8, 350 | 7, 676 | 8, 949, 115 |
| Southwest Georges |  | 3, 745 | 15, 585 | 15, 115 | 7, 370 | 4, 580 | 275 |  | 45 | 4, 410 | 16, 811 | 608 | 865, 386 |
| Lightship Grounds |  | 80 | 18, 245 | 550 | 49, 373 |  | 480 |  |  | 395 | 68, 246 |  | 426, 123 |
| Nantucket Shoals |  | 170 | 12, 720 | 80 | 26, 311 | 180 |  |  |  | 165 | 6, 150 |  | 193, 370 |
| Southern New England, unclassified |  | 18, 745 | 12, 183 | 4, 670 | 2, 280 | 6, 393 |  |  | 960 | 10, 288 | 103, 497 |  | 1, 463, 335 |
| Total | [2] 17, 695 | 3, 784, 010 | 1, 762, 436 | 1, 010, 184 | 913, 955 | 1, 042, 820 | 184, 198 | [2] 129 | 147, 246 | 1, 636, 935 | 21, 444, 317 | 53, 068 | 225, 024, 408 |

| Gear and area | Mackerel | Flounders |  |  |  |  |  | Swordfish | Whiting | Wolffish | Rosefish | Herring | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Gray sole | Lemon sole | Yellowtail | Blackback | Dab | Other |  |  |  |  |  |  |  |
| Otter trawls, medium: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Southwest Sable Island Bank | *Pounds* | *Pounds*<br>890 | *Pounds* | *Pounds* | *Pounds* | *Pounds*<br>540 | *Pounds* | *Pounds* | *Pounds* | *Pounds*<br>565 | *Pounds* | *Pounds* | *Pounds* | *Pounds*<br>62, 835 |
| Emerald Bank |  |  | 2, 050 | 200 | 200 |  |  |  |  |  |  |  |  | 43, 150 |
| Southern Nova Scotia |  | 51, 748 | 2, 475 | 950 | 400 | 8, 627 | 995 | 193 | 585 | 1, 643 | 2, 486, 163 |  |  | 3, 156, 028 |
| Browns Bank |  | 143, 516 | 1, 820 | 275 | 32 | 59, 356 | 2, 650 | 311 | 2, 500 | 22, 685 | 9, 476, 140 |  |  | 11, 659, 614 |
| Western Nova Scotia |  | 810 |  |  |  | 735 |  |  |  | 125 | 106, 000 |  |  | 131, 955 |
| Eastern Maine |  | 153, 681 |  |  | 195 | 29, 409 | 2, 925 |  | 22, 800 | 1, 950 | 1, 171, 920 |  |  | 1, 553, 114 |
| Central Maine |  | 346, 978 | 41, 245 | 950 | 500 | 88, 433 | 30, 550 |  | 94, 120 | 335 | 302, 492 |  | 450 | 1, 159, 038 |
| Western Maine |  | 273, 175 | 2, 000 | 19, 870 | 3, 895 | 53, 050 | 16, 495 |  | 40, 355 | 2, 530 | 467, 375 |  | 3, 833 | 1, 025, 563 |
| Eastern Massachusetts | 262 | 106, 195 | 150 | 28, 785 | 12, 025 | 67, 705 | 6, 465 |  | 391, 614 | 2, 865 | 728, 799 |  | 3, 989 | 4, 903, 177 |
| Inner Grounds |  | 72, 354 | 3, 995 | 970 | 3, 654 | 26, 826 | 2, 050 |  | 5, 060 | 2, 404 | 7, 391, 712 |  | 460 | 8, 073, 755 |
| Western Side South Channel | 1, 395 | 139, 775 | 83, 995 | 9, 098 | 136, 364 | 71, 197 | 6, 135 | 369 | 141, 369 | 21, 245 | 14, 620, 063 |  | 6, 264 | 19, 352, 947 |
| Eastern Side South Channel |  | 71, 195 | 130, 058 | 38, 247 | 43, 465 | 164, 768 | 7, 530 |  | 57, 515 | 45, 152 | 3, 787, 019 |  | 3, 234 | 9, 503, 750 |
| Northern Edge of Georges |  | 1, 806 | 104, 264 | 19, 662 | 20, 016 | 5, 108 | 2, 710 |  |  | 5, 091 | 110, 600 |  | 980 | 1, 633, 479 |
| Northeast Peak of Georges |  | 1, 570 | 24, 803 | 4, 550 | 3, 800 | 4, 275 | 250 |  |  | 5, 235 |  |  |  | 1, 373, 235 |
| Central Georges | 88 | 7, 698 | 209, 975 | 75, 080 | 69, 316 | 9, 105 | 5, 800 |  | 350 | 3, 030 |  |  | 4, 540 | 3, 587, 863 |
| Southeast Georges |  | 700 | 15, 125 | 3, 210 | 1, 786 | 600 |  |  |  | 1, 680 |  |  |  | 592, 944 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Southwest Georges | 1, 300 | 1, 525 | 71, 758 | 19, 953 | 10, 963 | 2, 245 | 4, 050 | | 450 | 1, 300 | 1, 100 | | | 1, 212, 887 |
| Lightship Grounds | | 3, 680 | 350 | 4, 100 | 2, 150 | | 30 | | | 90 | 15, 566 | | | 211, 254 |
| Nantucket Shoals | | | 2, 040 | | 4, 490 | 2, 170 | | | | 1, 155 | | | 300 | 76, 965 |
| Off No Mans Land | | 175 | | 176, 900 | | | 95 | | | | | | 12, 800 | 191, 860 |
| Southern Massachusetts | | | | 7, 400 | 350 | | | | | | | | 300 | 8, 215 |
| Southern New England, unclassified | | 604 | 7, 530 | 2, 260 | 4, 774 | 1, 210 | 1, 890 | | | 1, 905 | | | 3, 375 | 186, 757 |
| South | 295 | 440 | | | | 3, 155 | 680 | | 3, 240 | | | | 20, 045 | 97, 685 |
| Total | [2] 3, 340 | 1, 378, 515 | 703, 633 | 412, 460 | 318, 375 | 598, 514 | 91, 300 | [2] 873 | 759, 958 | 120, 985 | 40, 664, 949 | | 60, 570 | 69, 798, 070 |
| Otter trawls, small: | | | | | | | | | | | | | | |
| Misaine Bank | | 15, 065 | | 1, 215 | 1, 900 | 2, 625 | | | | 335 | 125 | | | 52, 975 |
| Southern Nova Scotia | 100 | | | 100 | | | 275 | | 3, 500 | 65 | | | 6, 005 | 10, 145 |
| Browns Bank | | | | | | | | | | | | | | 18, 880 |
| Western Nova Scotia | | | | 18, 500 | | | | | | | | | | 18, 500 |
| Northern Bay of Fundy | | 12, 765 | | | | 1, 422 | | | 3, 900 | | 40, 000 | | | 62, 802 |
| Eastern Maine | | 220, 048 | 9, 010 | 10, 060 | 5, 730 | 34, 955 | 7, 190 | | 56, 195 | 2, 615 | 576, 870 | | 215 | 1, 289, 004 |
| Central Maine | | 306, 732 | 14, 265 | 19, 420 | 15, 050 | 115, 110 | 17, 837 | | 207, 750 | 3, 540 | 447, 406 | | 2, 851 | 1, 616, 784 |
| Central Maine (occasional) | | 45 | | | | 25 | | | | | | | | 4, 402 |
| Western Maine | 1, 023 | 727, 176 | 5, 488 | 59, 825 | 31, 659 | 202, 862 | 40, 944 | | 1, 319, 090 | 19, 757 | 793, 678 | 645 | 77, 546 | 3, 888, 284 |
| Eastern Massachusetts | 995 | 795, 700 | 4, 505 | 897, 965 | 327, 790 | 561, 088 | 29, 373 | | 7, 480, 936 | 45, 710 | 460, 699 | | 47, 187 | 13, 897, 962 |
| Inner Grounds | | 12, 110 | 600 | 10, 175 | 2, 805 | 6, 850 | | | 4, 200 | | 2, 425 | | | 125, 970 |
| Western Side South Channel | | 156, 655 | 7, 445 | 124, 330 | 34, 655 | 56, 110 | 7, 405 | | 1, 022, 595 | 31, 645 | 226, 538 | | 4, 100 | 2, 555, 600 |
| Eastern Side South Channol | | 48 | 23, 320 | 9, 750 | 3, 655 | 500 | 500 | | | 100 | | | | 106, 162 |
| Central Georges | | 3, 350 | 25, 585 | 3, 175 | 3, 775 | 500 | 720 | | 2, 500 | | 9, 300 | | | 68, 769 |
| Southwest Georges | | 47 | 11, 950 | 1, 900 | 1, 925 | 500 | | | | 100 | | | | 53, 097 |
| Lightship Grounds | | | 1, 470 | 116, 300 | 3, 890 | | 110 | | | | | | | 127, 851 |
| Nantucket Shoals | | | 140 | 61, 225 | 5, 500 | | | | | 390 | | | | 69, 560 |
| Off No Mans Land | | 340 | | 278, 000 | 100 | | | | | | | | 3, 020 | 285, 665 |
| Southern Massachusetts | | 350 | 25 | 106, 700 | 815 | | 735 | | | 625 | | | 4, 837 | 120, 192 |
| Total | [2] 2, 118 | 2, 250, 431 | 103, 803 | 1, 718, 640 | 439, 249 | 982, 547 | 105, 089 | | 10, 100, 666 | 104, 882 | 2, 557, 041 | 645 | 145, 761 | 24, 372, 604 |
| Sink gill nets: | | | | | | | | | | | | | | |
| Browns Bank | | 135 | | | | 30 | | | | | 13, 900 | | | 15, 580 |
| Eastern Maine | | | | | | | | | | | | | | 2, 500 |
| Central Maine | | 340 | | 350 | 147 | 947 | 62 | | 5, 229 | 345 | 705 | | 12, 238 | 1, 999, 321 |
| Western Maine | 148 | 239 | 30 | 20 | 1, 880 | 1, 178 | 255 | | 723 | 1, 138 | 2, 740 | | 11, 893 | 3, 630, 667 |
| Eastern Massachusetts | 3, 315 | | | 9, 370 | 4, 260 | 19, 240 | 85 | | 250 | 425 | 70 | 1, 700 | 36, 088 | 10, 952, 313 |
| Inner Grounds | | | | | 30 | 135 | | | | 35 | 100 | | 748 | 401, 653 |
| Total | [2] 3, 463 | 714 | 30 | 9, 740 | 6, 317 | 21, 530 | 402 | | 6, 202 | 1, 943 | 17, 515 | 1, 700 | 60, 967 | 17, 002, 024 |

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[2] Incidental catch.

*Landings by fishing vessels at the three principal New England ports, 1938*—Continued

BY GEAR AND AREA—Continued

| Gear and area | Mackerel | Flounders | | | | | | Sword-fish | Whiting | Wolffish | Rosefish | Herring | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Gray sole | Lemon sole | Yellow-tail | Black-back | Dab | Other | | | | | | | |
| Drift gill nets: | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Western Maine | 13,420 | | | | 40 | | | | 710 | | | | 754 | 15,364 |
| Western Maine (occasional) | 90 | | | | | | | | | | | | | 90 |
| Eastern Massachusetts | 299,035 | | | | | | | | 710 | | | | 9,175 | 310,895 |
| Eastern Massachusetts (occasional) | 155 | | | | | | | | | | | | | 155 |
| Inner Grounds | 4,370 | | | | | | | | | | | | | 4,370 |
| Western Side South Channel | 31,565 | | | | | | | | | | | | 350 | 34,115 |
| Off No Mans Land | 9,915 | | | | | | | | | | | | 455 | 10,370 |
| South | 11,815 | | | | | | | | | | | | 1,770 | 13,585 |
| Total | 370,365 | | | | [2] 40 | | | | [2] 1,420 | | | | 12,501 | 388,944 |
| Purse seines: | | | | | | | | | | | | | | |
| Magdalen Islands (occasional) | 67,230 | | | | | | | | | | | | | 67,230 |
| Canso | 89,650 | | | | | | | | | | | | | 89,650 |
| Eastern Nova Scotia | 122,960 | | | | | | | | | | | | | 122,960 |
| Central Nova Scotia | 143,640 | | | | | | | | | | | | | 143,640 |
| Eastern Maine | | | | | | | | | | | | | 2,700 | 2,700 |
| Central Maine | 175,455 | | | | | | | | | | | 12,000 | 13,845 | 387,729 |
| Western Maine | 14,415 | | | | | | | | | | | | 5,700 | 26,715 |
| Eastern Massachusetts | 7,836,175 | 895 | | | | | | | | | | | 994,976 | 8,856,395 |
| Inner Grounds | 21,230 | | | | | | | | | | | | | 21,230 |
| Western Side South Channel | 5,735,335 | | | | | | | | | | | | 1,850 | 5,738,085 |
| Eastern Side South Channel | 25,000 | | | | | | | | | | | | 200 | 25,200 |
| Southwest Georges | 52,000 | | | | | | | | | | | | | 52,000 |
| Lightship Grounds | 26,100 | | | | | | | | | | | | | 26,100 |
| Off No Mans Land | 3,099,650 | | | | | | | | | | | | 875 | 3,100,525 |
| Rhode Island Shore | 26,700 | | | | | | | | | | | | 89,650 | 116,350 |
| South | 3,119,855 | | | | | | | | | | | | 275 | 3,120,130 |
| Total | 20,555,395 | [2] 895 | | | | | | | | | | 12,000 | 1,110,071 | 21,896,639 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Scallops drags: | | | | | | | | | | | | | | |
| Western Side South Channel | | | | | | | | | | | | | 158, 917 | 158, 917 |
| Eastern Side South Channel | | | 275 | | | | | | | | | | 338, 011 | 338, 286 |
| Northern Edge of Georges | | | 275 | | | | | | | | | | 216, 395 | 216, 670 |
| Northeast Peak of Georges | | | | | | | | | | | | | 32, 553 | 32, 553 |
| Central Georges | | | | | | | | | | | | | 900 | 900 |
| Southwest Georges | | | | | | | | | | | | | 13, 550 | 13, 550 |
| Lightship Grounds | | | | | 200 | | | | | | | | 67, 868 | 68, 068 |
| Total | | | [2] 550 | | [2] 200 | | | | | | | | 828, 194 | 828, 944 |
| Grand total | 20, 954, 526 | 7, 441, 990 | 2, 570, 952 | 3, 166, 314 | 1, 682, 546 | 2, 655, 248 | 381, 329 | 1, 322, 725 | 11, 027, 705 | 1, 982, 095 | 64, 704, 329 | 14, 345 | 2, 289, 561 | 402, 710, 099 |

SUMMARY: BY AREA

| Area | Vessels fishing | Trips | Days absent | Cod | | | Haddock | | Hake | | Pollock | Cusk | Halibut |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Large | Market | Scrod | Large | Scrod | Large | Small | | | |
| Gulf of St. Lawrence (area XIX): | *Number* | *Number* | *Number* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Treaty Coast | 2 | 4 | 81 | 845, 500 | 362, 592 | | | | | | | | |
| Magdalen Islands | 2 | 5 | 95 | 1, 639, 700 | 1, 191, 369 | | | | | | | | |
| Gulf of St. Lawrence, unclassified | 3 | 3 | 60 | 6, 783 | 7, 343 | | | | 135 | | | | 108, 484 |
| Newfoundland Banks (area XX): | | | | | | | | | | | | | |
| Grand Bank | 4 | 9 | 175 | 59, 871 | 7, 536 | | | | 6. 397 | 1, 170 | | 1, 028 | 213, 850 |
| St. Pierre Bank | 3 | 3 | 63 | 32, 395 | 4, 704 | | | | 1, 762 | | | 2, 952 | 45, 388 |
| Newfoundland Banks, unclassified | 4 | 7 | 53 | 63, 093 | 246, 326 | 4, 570 | 68, 550 | 11, 204 | 2, 104 | 120 | 2, 188 | 25 | 17, 806 |
| Total | [1] 11 | 31 | 527 | 2, 647, 342 | 1, 819, 870 | 4, 570 | 68, 550 | 11, 204 | 10, 398 | 1, 290 | 2, 188 | 4, 005 | 385, 528 |
| Off Nova Scotia (area XXI): | | | | | | | | | | | | | |
| Northeast Cape Breton | 15 | 15 | 292 | 3, 952 | 456 | | | | | | | | 17, 489 |
| Misaine Bank | 4 | 4 | 24 | 12, 130 | 8, 420 | | 10, 590 | 270 | 1, 145 | 4, 110 | 280 | 19, 480 | |
| Banquereau | 31 | 124 | 1, 236 | 2, 282, 366 | 9, 824, 593 | 592, 288 | 1, 383, 188 | 559, 739 | 36, 608 | 970 | 262, 296 | 9, 029 | 295, 837 |
| Canso | 4 | 5 | 54 | 7, 877 | 5, 256 | | 86, 875 | 6, 000 | 6, 835 | | 4, 350 | 1, 050 | 9, 784 |
| Middle Ground | 24 | 49 | 351 | 756, 831 | 1, 409, 229 | 117, 037 | 1, 151, 482 | 221, 610 | 19, 883 | 400 | 199, 158 | 2, 003 | 14, 834 |
| Northeast Sable Island Bank | 28 | 74 | 528 | 1, 564, 172 | 3, 511, 921 | 38, 085 | 1, 867, 498 | 601, 370 | 45, 024 | 2, 000 | 364, 426 | 10, 193 | 16, 565 |
| Southeast Sable Island Bank | 14 | 18 | 114 | 258, 919 | 593, 285 | 680 | 406, 190 | 253, 144 | 14, 366 | 3, 100 | 94, 928 | 4, 502 | 7, 111 |
| Horseshoe Ground | 41 | 202 | 1, 377 | 2, 665, 303 | 2, 806, 297 | 86, 406 | 6, 117, 635 | 641, 700 | 307, 266 | 994 | 1, 970, 455 | 32, 790 | 56, 003 |
| Southwest Sable Island Bank | 38 | 115 | 902 | 4, 122, 239 | 4, 578, 454 | 95, 260 | 4, 443, 529 | 442, 266 | 76, 400 | 9, 483 | 1, 389, 331 | 25, 049 | 55, 669 |
| Eastern Nova Scotia | 7 | 8 | 49 | 35, 750 | 30, 950 | 226 | 16, 428 | 3, 708 | 2, 910 | | 21, 120 | | 243 |
| Emerald Bank | 42 | 196 | 1, 196 | 2, 380, 519 | 3, 358, 409 | 78, 581 | 7, 303, 023 | 813, 787 | 148, 060 | 281 | 2, 104, 383 | 99, 639 | 57, 718 |
| Central Nova Scotia | 4 | 5 | 41 | 3, 100 | 1, 900 | | | 250 | 34, 100 | | 150 | 12, 625 | 179 |

[1] Exclusive of duplication.

[2] Incidental catch.

*Landings by fishing vessels at the three principal New England parts, 1938*—Continued

SUMMARY: BY AREA—Continued

| Area | Vessels fishing | Trips | Days absent | Cod |  |  | Haddock |  | Hake |  | Pollock | Cusk | Halibut |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Large | Market | Scrod | Large | Scrod | Large | Small |  |  |  |
| Off Nova Scotia—Continued. | *Number* | *Number* | *Number* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| La Have Bank (including Sambro Bank) | 13 | 29 | 278 | 144, 961 | 170, 601 | 13, 906 | 413, 858 | 45, 855 | 60, 276 | 5, 705 | 37, 754 | 113, 402 | 130, 112 |
| Southern Nova Scotia | 44 | 148 | 973 | 380, 891 | 439, 822 | 24, 663 | 931, 780 | 232, 378 | 238, 147 | 26, 270 | 105, 167 | 342, 279 | 4, 515 |
| Browns Bank | 69 | 661 | 5, 338 | 3, 680, 308 | 4, 200, 933 | 108, 696 | 17, 417, 816 | 3, 674, 703 | 941, 761 | 98, 454 | 1, 845, 260 | 1, 442, 215 | 251, 298 |
| Western Nova Scotia | 24 | 73 | 613 | 409, 566 | 580, 552 | 10, 510 | 1, 197, 851 | 210, 489 | 364, 780 | 36, 528 | 61, 674 | 504, 191 | 15, 146 |
| Southern Bay of Fundy | 3 | 4 | 43 | 13, 675 | 12, 545 |  | 99, 800 | 8, 700 | 33, 515 |  | 400 | 2, 100 | 178 |
| Nova Scotia, unclassified | 21 | 34 | 278 | 420, 578 | 504, 397 | 16, 663 | 813, 187 | 192, 977 | 47, 170 |  | 170, 742 | 21. 835 | 55, 074 |
| Total | [1] 159 | 1, 764 | 13, 687 | 19, 143, 137 | 32, 038, 020 | 1, 183, 001 | 43, 660, 730 | 7, 911, 946 | 2, 378, 246 | 188, 295 | 8, 631, 874 | 2, 642, 382 | 990, 755 |
| Off New England (area XXII): |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Northern Bay of Fundy | 2 | 2 | 13 | 1, 035 | 140 |  | 1, 135 | 20 |  | 1, 475 | 910 |  |  |
| Eastern Maine | 30 | 141 | 895 | 96, 138 | 59, 967 | 375 | 168, 819 | 21, 195 | 66, 780 | 584, 329 | 25, 192 | 195, 439 | 3, 019 |
| Central Maine | 48 | 864 | 1, 933 | 683, 431 | 188, 850 | 5, 767 | 256, 129 | 25, 443 | 556, 195 | 692, 455 | 1, 309, 421 | 545, 644 | 3, 146 |
| Western Maine | 61 | 2, 369 | 3, 232 | 1, 246, 518 | 384, 147 | 68, 843 | 835, 646 | 35, 912 | 467, 248 | 682, 114 | 1, 730, 027 | 136, 593 | 4. 062 |
| Eastern Massachusetts | 80 | 6, 219 | 11, 754 | 1, 854, 603 | 1, 462, 631 | 141, 418 | 1, 455, 384 | 238, 634 | 1, 132, 162 | 1, 270, 432 | 12, 092, 707 | 99, 600 | 1, 590 |
| Inner Grounds | 70 | 553 | 1, 944 | 431, 151 | 400, 217 | 9, 765 | 1, 253. 930 | 142, 426 | 718, 413 | 415. 671 | 805, 006 | 1, 211, 446 | 9, 407 |
| Western Side South Channel | 80 | 1, 072 | 5, 538 | 1. 935, 335 | 2, 914, 770 | 83, 391 | 6, 903, 289 | 5, 294, 405 | 1, 028, 664 | 192, 332 | 1, 220, 471 | 148, 483 | 20, 863 |
| Eastern Side South Channel | 67 | 476 | 2. 878 | 1, 013, 993 | 1, 434, 568 | 38, 878 | 7, 206, 353 | 3, 347, 341 | 1, 069, 699 | 17, 657 | 1, 417, 823 | 492, 547 | 21, 116 |
| Northern Edge of Georges | 59 | 363 | 2, 487 | 1, 525, 691 | 4, 558, 013 | 279, 112 | 5, 781, 788 | 6, 034, 605 | 241, 567 | 3, 227 | 1, 076, 630 | 124, 112 | 38, 514 |
| Northeast Peak of Georges | 60 | 538 | 4, 095 | 5, 158, 980 | 7, 147, 225 | 493, 815 | 13, 687, 072 | 14, 512, 948 | 338, 972 | 8, 755 | 2, 985, 783 | 105, 336 | 60, 888 |
| Central Georges | 42 | 191 | 1, 198 | 812, 070 | 832, 835 | 50, 485 | 3, 344, 442 | 3, 607, 385 | 55, 977 | 1, 945 | 269, 012 | 4, 042 | 13, 482 |
| Southeast Georges | 42 | 134 | 1, 017 | 1, 797, 380 | 1. 058, 591 | 12, 267 | 4, 168, 722 | 1, 830, 191 | 57, 492 | 1, 290 | 384, 947 | 3, 174 | 23, 322 |
| Southwest Georges | 36 | 65 | 509 | 76, 078 | 134, 024 | 210 | 1, 194, 577 | 481, 460 | 11, 004 |  | 30, 035 | 190 | 4, 182 |
| Lightship Grounds | 30 | 36 | 231 | 18, 970 | 61, 487 | 1, 564 | 226, 477 | 146, 394 | 15, 450 | 1, 692 | 7, 801 | 225 | 63 |
| Nantucket Shoals | 9 | 12 | 54 | 11, 028 | 34, 964 | 3, 538 | 79, 229 | 75, 668 | 7, 095 | 214 | 4, 899 | 30 | 44 |
| Off No Man's Land | 38 | 109 | 406 | 4, 610 | 5, 180 | 50 | 22, 485 | 2, 645 | 6, 310 | 3, 120 | 3, 375 | 45, 268 | 626 |
| Southern Massachusetts | 6 | 9 | 34 | 1, 495 | 370 |  | 2, 525 | 1, 075 | 505 |  | 300 |  |  |
| Rhode Island Shore | 3 | 3 | 7 |  |  |  |  |  |  |  |  |  |  |
| Southern New England unclassified | 26 | 37 | 322 | 166, 371 | 225, 900 | 11, 530 | 492, 901 | 281, 635 | 32, 980 |  | 246, 884 | 6, 805 | 2, 522 |
| Total | [1] 386 | 13, 193 | 38, 547 | 16, 834, 877 | 20, 903, 879 | 1, 201. 008 | 47, 080. 903 | 36, 079, 382 | 5, 809, 513 | 3, 876, 708 | 23, 611, 223 | 3, 118, 934 | 206, 846 |
| Off Middle Atlantic States (area XXIII): |  |  |  |  |  |  |  |  |  |  |  |  |  |
| South | 56 | 96 | 502 | 2. 240 | 1. 410 |  | 23, 520 | 40, 610 | 150 | 645 | 1, 255 |  |  |
| Grand total | [1] 389 | 15, 084 | 53, 263 | 38, 627, 596 | 54, 763, 179 | 2. 388, 579 | 90, 833, 703 | 44, 043, 142 | 8, 198, 307 | 4, 066, 938 | 32, 246, 540 | 5, 765, 321 | 1, 583, 129 |

| Area | Mackerel | Flounders |  |  |  |  |  | Swordfish | Whiting | Wolffish | Rosefish | Herring | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Gray sole | Lemon sole | Yellow-tail | Black-back | Dab | Other |  |  |  |  |  |  |  |
| Gulf of St. Lawrence (area XIX): | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Treaty Coast |  |  |  |  |  |  |  |  |  |  |  |  |  | 1,208,092 |
| Magdalen Islands | 67,230 |  |  |  |  |  |  |  |  |  |  |  |  | 2,898,299 |
| Gulf of St. Lawrence, unclassified |  |  |  |  |  |  |  |  |  |  |  |  |  | 122.745 |
| Newfoundland Banks (area XX): |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Grand Bank |  |  |  |  |  |  |  |  |  |  |  |  |  | 289,852 |
| St. Pierre Bank |  |  |  |  |  |  |  |  |  |  |  |  |  | 87,201 |
| Newfoundland Banks, unclassified | 1,500 |  |  | 4,053 |  |  |  | 547 |  | 406 |  |  |  | 422,492 |
| Total | 68,730 |  |  | 4,053 |  |  |  | 547 |  | 406 |  |  |  | 5,028,681 |
| Off Nova Scotia (area XXI): |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Northeast Cape Breton |  |  |  |  |  |  |  | 95,146 |  |  |  |  |  | 117,043 |
| Misaine Bank |  | 15,065 |  | 1,215 | 1,900 | 2,625 |  |  |  | 335 | 125 |  |  | 77,690 |
| Banquereau | 1,870 | 10,674 | 4,655 | 129,048 | 5,360 | 21,150 | 3,028 | 1,386 |  | 23,558 | 149,595 |  | 920 | 15,598,158 |
| Canso | 89,650 | 54,750 |  |  |  | 250 |  |  |  | 1.450 |  |  | 70 | 274,197 |
| Middle Ground |  | 158.132 | 14,024 | 127,595 |  | 21,045 | 2,050 |  |  | 28,711 | 35,340 |  | 70 | 4,279,431 |
| Northeast Sable Island Bank | 40 | 43,934 | 10,129 | 47,465 | 750 | 22,155 |  |  |  | 56,876 | 20,460 |  | 100 | 8,226,163 |
| Southeast Sable Island Bank |  | 8,342 | 7,700 | 346 |  | 9,095 |  |  |  | 16,232 | 19,025 |  |  | 1,696,965 |
| Horseshoe Ground | 2,000 | 2,484,371 | 60,864 | 195,038 | 1,770 | 34,059 | 53,832 |  |  | 151,736 | 94,207 |  | 2,290 | 17,765.016 |
| Southwest Sable Island Bank |  | 83,029 | 10,148 | 16,049 | 600 | 19,756 | 4,310 |  |  | 322,930 | 8,137 |  | 1,360 | 15,703,999 |
| Eastern Nova Scotia | 122,960 | 120,350 |  |  |  | 400 |  |  |  | 1.210 |  |  |  | 356,255 |
| Emerald Bank | 200 | 67,712 | 38,572 | 81,623 | 796 | 26,248 | 27,300 | 382 |  | 202,698 | 13,778 |  | 1,110 | 16,804,819 |
| Central Nova Scotia | 143,640 |  |  |  |  |  |  |  |  |  |  |  |  | 195,944 |
| La Have Bank (including Sambro Bank) |  | 18,204 |  | 10 | 15 | 1,390 | 50 | 11,253 |  | 10,448 | 12,500 |  |  | 1,190,300 |
| Southern Nova Scotia | 100 | 77,231 | 5,603 | 7,825 | 628 | 16,247 | 3,170 | 249 | 66,368 | 20,851 | 5,516,928 |  | 6,125 | 8,447,237 |
| Browns Bank | 170 | 236,299 | 36,206 | 25,851 | 6,123 | 147,515 | 6,815 | 295,699 | 65,052 | 427,321 | 13,348,893 |  | 668 | 48,261,056 |
| Western Nova Scotia | 1,500 | 32,810 |  | 18,500 | 400 | 835 |  | 934 |  | 17,375 | 241,545 |  | 6,032 | 3,711,218 |
| Southern Bay of Fundy |  |  |  |  |  |  |  |  |  |  |  |  |  | 170.913 |
| Nova Scotia, unclassified | 40 | 34,625 | 1,961 | 11,172 |  | 16,769 | 11,600 |  |  | 32,940 | 12,900 |  |  | 2,364,630 |
| Total | 362,170 | 3,445,528 | 189,862 | 661.737 | 18,342 | 339,539 | 112,155 | 405,049 | 131,420 | 1,314,671 | 19,473,433 |  | 18,745 | 145,241,037 |

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[1] Exclusive of duplication.

*Landings by fishing vessels at the three principal New England ports, 1938*—Continued

SUMMARY: BY AREA—Continued

| Area | Mackerel | Flounders |  |  |  |  |  | Swordfish | Whiting | Wolffish | Rosefish | Herring | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Gray sole | Lemon sole | Yellow-tail | Black-back | Dab | Other |  |  |  |  |  |  |  |
|  | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Off New England (area XXII): |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Northern Bay of Fundy | ------- | 12, 765 | ------- | ------- | ------- | 1, 422 | ------- | ------- | 3, 900 | ------- | 40, 000 | ------- | ------- | 62, 802 |
| Eastern Maine | ------- | 376, 424 | 9, 010 | 16, 050 | 7, 275 | 65, 509 | 10, 455 | ------- | 78, 995 | 5, 365 | 1, 748, 790 | ------- | 2, 925 | 3, 542, 051 |
| Central Maine | 175, 455 | 654, 095 | 55, 510 | 20, 720 | 15, 712 | 204, 590 | 48, 449 | ------- | 307, 099 | 4, 355 | 753, 425 | 12, 000 | 29, 587 | 6, 547, 478 |
| Western Maine | 29, 746 | 1, 025, 795 | 7, 518 | 79, 715 | 37, 519 | 260, 355 | 57, 694 | ------- | 1, 362, 591 | 40, 575 | 1, 283, 358 | 645 | 107, 492 | 9, 884, 113 |
| Eastern Massachusetts | 8, 139, 937 | 903, 090 | 5, 155 | 945. 420 | 347, 075 | 653, 213 | 35, 923 | ------- | 7, 882, 510 | 65, 775 | 1, 189, 913 | 1, 700 | 1, 095, 572 | 41, 014, 444 |
| Inner Grounds | 25, 600 | 98, 698 | 8, 535 | 13, 257 | 9, 274 | 37, 406 | 3, 770 | ------- | 9, 260 | 4, 620 | 9, 174, 304 | ------- | 1, 466 | 14, 783, 622 |
| Western Side South Channel | 5, 768, 695 | 437, 214 | 485, 867 | 153, 514 | 772, 316 | 166, 033 | 26, 800 | 6, 312 | 1, 168, 019 | 104, 997 | 21, 574, 223 | ------- | 173, 345 | 50, 579, 338 |
| Eastern Side South Channel | 25, 080 | 267, 657 | 292, 628 | 70, 652 | 97, 618 | 650, 813 | 21, 155 | 3, 153 | 64, 425 | 114, 926 | 8, 648, 144 | ------- | 353, 151 | 26, 669, 377 |
| Northern Edge of Georges | 632 | 67, 015 | 441, 495 | 96, 028 | 82, 424 | 155, 531 | 19, 370 | 285, 398 | 6, 302 | 88, 907 | 378, 590 | ------- | 228, 026 | 21, 515, 977 |
| Northeast Peak of Georges | 10, 518 | 59, 031 | 353, 798 | 77, 171 | 36. 957 | 50, 547 | 18, 468 | 339, 239 | 5, 039 | 164, 636 | 175, 055 | ------- | 44, 484 | 45, 834, 717 |
| Central Georges | 308 | 30, 747 | 504, 520 | 203, 254 | 134, 180 | 26, 730 | 13, 910 | 5, 119 | 3, 450 | 21, 320 | 45, 374 | ------- | 7, 364 | 9, 987, 951 |
| Southeast Georges | 25 | 34, 030 | 63, 058 | 29, 590 | 3, 363 | 23, 127 | 4, 835 | 88, 316 | ------- | 30, 629 | 8, 350 | ------- | 7, 676 | 9, 630, 375 |
| Southwest Georges | 53, 300 | 5, 317 | 99, 293 | 36, 968 | 20, 258 | 7, 325 | 4, 325 | 110, 985 | 495 | 5, 810 | 17, 911 | ------- | 14, 158 | 2, 307, 905 |
| Lightship Grounds | 26, 100 | 3, 760 | 20, 065 | 120, 950 | 55, 613 | ------- | 620 | 34, 992 | ------- | 485 | 83, 812 | ------- | 67, 868 | 894, 388 |
| Nantucket Shoals | ------- | 170 | 14, 900 | 61, 305 | 36, 301 | 2, 350 | ------- | ------- | ------- | 1, 710 | 6, 150 | ------- | 300 | 339, 895 |
| Off No Man's Land | 3, 109, 565 | 515 | ------- | 454, 900 | 100 | ------- | 95 | 1, 510 | ------- | 90 | ------- | ------- | 17, 150 | 3, 677, 594 |
| Southern Massachusetts | ------- | 350 | 25 | 114, 100 | 1, 165 | ------- | 735 | ------- | ------- | 625 | ------- | ------- | 5, 137 | 128, 407 |
| Rhode Island Shore | 26, 700 | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | 89, 650 | 116, 350 |
| Southern New England, unclassified | ------- | 19, 349 | 19, 713 | 6, 930 | 7, 054 | 7, 603 | 1, 890 | 18, 536 | 960 | 12, 193 | 103, 497 | ------- | 3, 375 | 1, 668, 628 |
| Total | 17, 391, 661 | 3, 996, 022 | 2, 381, 090 | 2, 500, 524 | 1, 664, 204 | 2, 312, 554 | 268, 494 | 893, 560 | 10, 893, 015 | 667, 018 | 45, 230, 896 | 14, 345 | 2, 248, 726 | 249, 185, 412 |
| Off Middle Atlantic States (area XXIII): |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| South | 3, 131, 965 | 440 | ------- | ------- | ------- | 3, 155 | 680 | 23, 569 | 3, 240 | ------- | ------- | ------- | 22, 090 | 3, 254, 969 |
| Grand total | 20, 954, 526 | 7, 441, 990 | 2, 570, 952 | 3, 166, 314 | 1, 682, 546 | 2, 655, 248 | 381, 329 | 1, 322, 725 | 11, 027. 705 | 1, 982. 095 | 64, 704, 329 | 14, 345 | 2, 289, 561 | 402, 710, 099 |

NOTE.—The weight of salted fish landed has been converted to the equivalent of fresh fish as landed. The roman numerals appearing in the stub of the above table refer to the numbers given these regions by the North American Council on Fishery Investigations.

## SALES OF FISHERY PRODUCTS THROUGH THE NEW ENGLAND FISH EXCHANGE, BOSTON, MASS.

Fishery products landed at the Boston Fish Pier and sold through the New England Fish Exchange in Boston during 1939 aggregated 274,983,112 pounds. Sales through the Exchange reached a peak of 27,760,726 pounds in May, and their lowest level of 17,512,586 pounds in January. The average price for sales of all species of fish through the Exchange during 1939 amounted to $2.79 per hundred pounds; the highest average price being $3.34 per hundred pounds in October and the lowest $2.05 in May.

The data covering sales through the New England Fish Exchange are collected through the Division's Fishery Market News Service and the figures vary from those shown for Boston in the section of this report entitled "Vessel Fisheries at the Principal New England Ports." The reason for this variation is that sales through the New England Fish Exchange include craft smaller than vessels, that is, craft of less than five net tons capacity, and further do not include landings elsewhere in Boston which are not sold through the Exchange.

*Sales of fishery products through the New England Fish Exchange, Boston, Mass., 1939*

VOLUME: BY SPECIES AND MONTHS

| Month | Total fares | Cod | | | | | | Cusk | | | Flounders[3] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Large[1] | | | Market[2] | | | | | | | | |
| | | Offshore vessels | Inshore craft | Total | Offshore vessels | Inshore craft | Total | Offshore vessels | Inshore craft | Total | Offshore vessels | Inshore craft | Total |
| | *Number* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| January | 388 | 1, 338, 745 | 77, 420 | 1, 416, 165 | 1, 410, 845 | 255, 360 | 1, 666, 205 | 215, 825 | 5, 675 | 221, 500 | 877, 205 | 469, 610 | 1, 346, 815 |
| February | 373 | 2, 969, 975 | 98, 774 | 3, 068, 749 | 1, 995, 445 | 176, 100 | 2, 171, 545 | 160, 420 | 4, 830 | 165, 250 | 812, 890 | 285, 815 | 1, 098, 705 |
| March | 469 | 3, 314, 040 | 136, 863 | 3, 450, 903 | 2, 715, 975 | 139, 565 | 2, 855, 540 | 249, 175 | 13, 780 | 262, 955 | 1, 224, 670 | 417, 727 | 1, 642, 397 |
| April | 461 | 3, 002, 595 | 176, 724 | 3, 179, 319 | 5, 039, 590 | 186, 855 | 5, 226, 445 | 256, 375 | 19, 670 | 276, 045 | 786, 440 | 670, 910 | 1, 457, 350 |
| May | 610 | 2, 503, 400 | 213, 835 | 2, 717, 235 | 3, 631, 255 | 99, 155 | 3, 730, 410 | 313, 025 | 64, 880 | 377, 905 | | 813, 275 | 813, 275 |
| June | 646 | 1, 318, 500 | 133, 505 | 1, 452, 005 | 3, 613, 645 | 94, 573 | 3, 708, 218 | 85, 575 | 45, 035 | 130, 610 | | 668, 570 | 668, 570 |
| July | 722 | 1, 721, 085 | 71, 212 | 1, 792, 297 | 3, 263, 455 | 66, 922 | 3, 330, 377 | 101, 640 | 47, 860 | 149, 500 | | 645, 325 | 645, 325 |
| August | 780 | 1, 362, 500 | 27, 420 | 1, 389, 920 | 2, 783, 975 | 42, 735 | 2, 826, 710 | 248, 140 | 43, 740 | 291, 880 | | 556, 220 | 556, 220 |
| September | 714 | 1, 063, 095 | 33, 263 | 1, 096, 358 | 1, 711, 420 | 37, 525 | 1, 748, 945 | 408, 375 | 77, 505 | 485, 880 | | 697, 985 | 697, 985 |
| October | 623 | 1, 360, 505 | 45, 708 | 1, 406, 213 | 1, 949, 825 | 62, 975 | 2, 012, 800 | 596, 420 | 55, 255 | 651, 675 | | | |
| November | 538 | 1, 880, 270 | 75, 087 | 1, 955, 357 | 5, 139, 245 | 136, 437 | 5, 275, 682 | 462, 285 | 40, 860 | 503, 145 | | | |
| December | 532 | 1, 857, 405 | 125, 465 | 1, 982, 870 | 2, 642, 290 | 263, 230 | 2, 905, 520 | 532, 425 | 21, 465 | 553, 890 | | | |
| Total | 6, 856 | 23, 692, 115 | 1, 215, 276 | 24, 907, 391 | 35, 896, 965 | 1, 561, 432 | 37, 458, 397 | 3, 629, 680 | 440, 555 | 4, 070, 235 | 3, 701, 205 | 5, 225, 437 | 8, 926, 642 |

| Month | Blackbacks[4] | | | Dabs[4] | | | Sole[4] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Gray | | | Lemon | | |
| | Offshore vessels | Inshore craft | Total | Offshore vessels | Inshore craft | Total | Offshore vessels | Inshore craft | Total | Offshore vessels | Inshore craft | Total |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| January | | | | | | | | | | | | |
| February | | | | | | | | | | | | |
| March | | | | | | | | | | | | |
| April | | | | | | | | | | | | |
| May | 63, 705 | | 63, 705 | 135, 362 | | 135, 362 | 83, 475 | | 83, 475 | 435, 425 | | 435, 425 |
| June | 56, 095 | | 56, 095 | 179, 950 | | 179, 950 | 29, 030 | | 29, 030 | 267, 970 | | 267, 970 |
| July | 130, 470 | | 130, 470 | 27, 200 | | 27, 200 | 20, 645 | | 20, 645 | 228, 470 | | 228, 470 |
| August | 207, 455 | | 207, 455 | 7, 700 | | 7, 700 | 9, 860 | | 9, 860 | 396, 550 | | 396, 550 |
| September | 222, 935 | | 222, 935 | 13, 200 | | 13, 200 | 82, 630 | | 82, 630 | 246, 085 | | 246, 085 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| October | 171, 760 | 32, 230 | 203, 990 | 39, 170 | 172, 530 | 211, 700 | 127, 735 | 123, 525 | 251, 260 | 278, 760 | 18, 605 | 297, 365 |
| November | 33, 965 | 45, 060 | 79, 025 | 27, 700 | 48, 255 | 75, 955 | 66, 485 | 33, 900 | 100, 385 | 146, 650 | 4, 885 | 151, 535 |
| December | 19, 495 | 32, 220 | 51, 715 | 54, 325 | 72, 000 | 126, 325 | 129, 550 | 75, 640 | 205, 190 | 116, 785 | 150 | 116, 935 |
| Total | 905, 880 | 109, 510 | 1, 015, 390 | 484, 607 | 292, 785 | 777, 392 | 549, 410 | 233, 065 | 782, 475 | 2, 116, 695 | 23, 640 | 2, 140, 335 |

| Month | Yellowtail [4] | | | Halibut | | | Haddock | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Large | | | Scrod | | |
| | Offshore vessels | Inshore craft | Total | Offshore vessels | Inshore craft | Total | Offshore vessels | Inshore craft | Total | Offshore vessels | Inshore craft | Total |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| January | | | | 28, 994 | 68 | 29, 062 | 5, 135, 550 | 42, 770 | 5, 178, 320 | 1, 959, 745 | 25, 320 | 1, 985, 065 |
| February | | | | 75, 610 | 116 | 75, 726 | 6, 491, 565 | 85, 260 | 6, 576, 825 | 2, 805, 650 | 16, 995 | 2, 822, 645 |
| March | | | | 172, 093 | 87 | 172, 180 | 9, 934, 415 | 95, 360 | 10, 029, 775 | 3, 514, 995 | 13, 655 | 3, 528, 650 |
| April | | | | 183, 767 | 539 | 184, 306 | 7, 629, 650 | 108, 765 | 7, 738, 415 | 3, 065, 240 | 40, 815 | 3, 106, 055 |
| May | 186, 645 | | 186, 645 | 154, 472 | 937 | 155, 409 | 8, 537, 175 | 266, 335 | 8, 803, 510 | 3, 810, 235 | 158, 035 | 3, 968, 270 |
| June | 150, 490 | | 150, 490 | 147, 589 | 82 | 147, 671 | 5, 354, 900 | 354, 495 | 5, 709, 395 | 3, 163, 450 | 372, 175 | 3, 535, 625 |
| July | 25, 650 | | 25, 650 | 161, 059 | 101 | 161, 160 | 5, 976, 460 | 472, 138 | 6, 448, 598 | 4, 773, 505 | 308, 550 | 5, 082, 055 |
| August | 39, 720 | | 39, 720 | 106, 782 | 406 | 107, 188 | 5, 925, 355 | 282, 680 | 6, 208, 035 | 6, 385, 225 | 154, 460 | 6, 539, 685 |
| September | 40, 625 | | 40, 625 | 78, 181 | 123 | 78, 304 | 5, 094, 500 | 214, 910 | 5, 309, 410 | 4, 745, 525 | 164, 140 | 4, 909, 665 |
| October | 53, 975 | 556, 565 | 610, 540 | 54, 898 | 138 | 55, 036 | 4, 829, 950 | 257, 166 | 5, 087, 116 | 4, 188, 310 | 226, 340 | 4, 414, 650 |
| November | 148, 117 | 197, 640 | 345, 757 | 11, 769 | 309 | 12, 078 | 3, 205, 135 | 271, 415 | 3, 476, 550 | 2, 147, 145 | 205, 855 | 2, 353, 000 |
| December | 184, 735 | 176, 150 | 360, 885 | 17, 826 | 133 | 17, 959 | 5, 163, 665 | 155, 760 | 5, 319, 425 | 2, 821, 460 | 100, 925 | 2, 922, 385 |
| Total | 829, 957 | 930, 355 | 1, 760, 312 | 1, 193, 040 | 3, 039 | 1, 196, 079 | 73, 278, 320 | 2, 607, 054 | 75, 885, 374 | 43, 380, 485 | 1, 787, 265 | 45, 167, 750 |

[1] Includes whale cod.

[2] Includes scrod cod.

[3] Shown separately as blackbacks, dabs, gray sole, lemon sole, and yellowtails if taken by offshore vessels after April 1939 or by inshore craft after September 1939.

[4] Included under flounders if taken before May 1939 by offshore vessels or before October 1939 by inshore craft.

*Sales of fishery products through the New England Fish Exchange, Boston, Mass., 1939*—Continued

VOLUME: BY SPECIES AND MONTHS—Continued

| Month | Hake | | | Mackerel | Pollock | | | Rosefish | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Offshore vessels | Inshore craft | Total | All craft [5] | Offshore vessels | Inshore craft | Total | Offshore vessels | Inshore craft | Total |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| January | 484, 245 | 80, 305 | 564, 550 | 77, 675 | 1, 693, 473 | 6, 435 | 1, 699, 908 | 2, 828, 655 | 311, 925 | 3, 140, 580 |
| February | 461, 440 | 65, 140 | 526, 580 | | 1, 218, 300 | 2, 490 | 1, 220, 790 | 3, 500, 998 | 230, 105 | 3, 731, 103 |
| March | 355, 125 | 25, 675 | 380, 800 | | 1, 542, 905 | 3, 280 | 1, 546, 185 | 1, 548, 211 | 282, 184 | 1, 830, 395 |
| April | 167, 650 | 31, 500 | 199, 150 | | 1, 304, 735 | 6, 325 | 1, 311, 060 | 600, 836 | 488, 571 | 1, 089, 407 |
| May | 198, 425 | 86, 993 | 285, 418 | 1, 499, 190 | 1, 651, 880 | 38, 945 | 1, 690, 825 | 668, 455 | 1, 122, 322 | 1, 790, 777 |
| June | 112, 530 | 214, 105 | 326, 635 | 1, 091, 650 | 259, 415 | 63, 675 | 323, 090 | 982, 993 | 1, 097, 068 | 2, 080, 061 |
| July | 142, 365 | 261, 915 | 404, 280 | 400, 533 | 383, 690 | 78, 195 | 461, 885 | 1, 078, 680 | 411, 312 | 1, 489, 992 |
| August | 381, 110 | 294, 195 | 675, 305 | 1, 986, 960 | 283, 085 | 50, 305 | 333, 390 | 1, 120, 249 | 209, 793 | 1, 330, 042 |
| September | 377, 940 | 513, 075 | 891, 015 | 2, 507, 543 | 910, 375 | 47, 980 | 988, 355 | 1, 908, 575 | 170, 880 | 2, 079, 455 |
| October | 718, 860 | 521, 360 | 1, 240, 220 | 585, 505 | 740, 450 | 70, 310 | 810, 760 | 2, 266, 992 | 300, 865 | 2, 567, 857 |
| November | 713, 770 | 376, 025 | 1, 089, 795 | 593, 875 | 2, 092, 825 | 1, 421, 435 | 3, 514, 260 | 1, 299, 966 | 53, 620 | 1, 353, 586 |
| December | 440, 000 | 101, 645 | 541, 645 | 484, 440 | 3, 706, 590 | 728, 440 | 4, 435, 030 | 1, 708, 960 | 50, 810 | 1, 759, 770 |
| Total | 4, 553, 460 | 2, 571, 933 | 7, 125, 393 | 9, 227, 371 | 15, 817, 723 | 2, 517, 815 | 18, 335, 538 | 19, 513, 570 | 4, 729, 455 | 24, 243, 025 |

| Month | Swordfish | Whiting [6] | | | Wolffish | | | Scallops, sea | Miscellaneous [7] | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Offshore vessels | Offshore vessels | Inshore craft | Total | Offshore vessels | Inshore craft | Total | Offshore vessels | Offshore vessels | Inshore craft | Total | Offshore vessels | Inshore craft | Total |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| January | | 21, 100 | 180 | 21, 280 | 109, 720 | 880 | 110, 600 | 35, 902 | 13, 639 | 5, 320 | 18, 959 | 16, 231, 318 | 1, 281, 268 | 17, 512, 586 |
| February | | | | | 133, 160 | 4, 690 | 137, 850 | 53, 546 | 10, 830 | 13, 875 | 24, 705 | 20, 689, 829 | 984, 190 | 21, 674, 019 |
| March | | 6, 125 | 75 | 6, 200 | 158, 665 | 16, 393 | 175, 058 | 103, 559 | 10, 425 | 8, 470 | 18, 895 | 24, 850, 378 | 1, 153, 114 | 26, 003, 492 |
| April | | 150 | 2, 035 | 2, 185 | 377, 660 | 33, 680 | 411, 340 | 147, 227 | 3, 040 | 48, 445 | 51, 485 | 22, 564, 955 | 1, 814, 834 | 24, 379, 789 |
| May | | 9, 975 | 208, 660 | 218, 635 | 508, 350 | 78, 095 | 586, 445 | 209, 457 | 2, 688 | 6, 665 | 9, 353 | 21, 602, 594 | 3, 158, 132 | 27, 760, 726 |
| June | 50, 215 | 7, 000 | 602, 320 | 609, 320 | 122, 170 | 38, 620 | 160, 790 | 336, 559 | 1, 725 | 4, 230 | 5, 955 | 17, 331, 451 | 3, 688, 453 | 21, 019, 904 |
| July | 276, 729 | 2, 340 | 1, 787, 805 | 1, 790, 145 | 83, 395 | 5, 085 | 88, 480 | 163, 810 | 6, 563 | 7, 925 | 14, 488 | 18, 967, 744 | 4, 164, 345 | 23, 132, 089 |
| August | 763, 862 | 700 | 1, 775, 214 | 1, 775, 914 | 44, 920 | 940 | 45, 860 | 134, 617 | 49, 571 | 6, 890 | 56, 461 | 22, 238, 336 | 3, 444, 998 | 25, 683, 334 |
| September | 232, 982 | | 1, 248, 817 | 1, 248, 817 | 33, 530 | 150 | 33, 680 | 226, 818 | 10, 860 | 56, 070 | 66, 930 | 19, 945, 194 | 3, 262, 423 | 23, 207, 617 |
| October | 42, 205 | 3, 800 | 656, 735 | 660, 535 | 30, 440 | 480 | 30, 920 | 117, 503 | 33, 105 | 101, 977 | 138, 082 | 18, 190, 168 | 3, 205, 764 | 21, 395, 932 |
| November | | | 165, 795 | 165, 795 | 20, 330 | 145 | 20, 475 | 39, 741 | 12, 604 | 35, 725 | 48, 329 | 18, 041, 877 | 3, 112, 448 | 21, 154, 325 |
| December | | 100 | 18, 155 | 18, 255 | 44, 855 | 3, 655 | 48, 510 | 180, 560 | 2, 740 | 25, 250 | 27, 990 | 20, 108, 206 | 1, 951, 093 | 22, 059, 299 |
| Total | 1, 365, 993 | 51, 290 | 6, 465, 791 | 6, 517, 081 | 1, 667, 195 | 182, 813 | 1, 850, 008 | 1, 749, 299 | 157, 790 | 323, 842 | 481, 632 | 243, 762, 050 | 31, 221, 062 | 274, 983, 112 |

## PRICES: BY SPECIES AND MONTHS

| Month | Total fares | Cod |  |  |  |  |  |  |  | Cusk |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Large [1] |  |  |  | Market [2] |  |  |  | Offshore vessels |  | Inshore craft |  |
|  |  | Offshore vessels |  | Inshore craft |  | Offshore vessels |  | Inshore craft |  |  |  |  |  |
|  |  | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price |
| January | 388 | $4.42–$5.03 | $4.36 | $4.84–$5.79 | $5.26 | $3.63–$3.93 | $3.63 | $3.50–$4.13 | $3.80 | $3.24 | $2.88 | $2.77–$2.86 | $3.00 |
| February | 373 | 3.60– 3.79 | 2.92 | 3.64– 4.67 | 4.04 | 3.33– 3.59 | 3.14 | 3.02– 3.58 | 3.23 | $3.45– 3.52 | 2.92 | 3.96– 4.29 | 3.56 |
| March | 469 | 3.54– 3.70 | 3.13 | 3.92– 4.77 | 4.04 | 3.14– 3.34 | 3.03 | 3.28– 3.64 | 3.25 | 3.24 | 2.89 | 2.97– 3.34 | 3.38 |
| April | 461 | 2.02– 3.24 | 2.05 | 2.98– 4.20 | 3.51 | 1.81– 2.54 | 1.80 | 2.15– 2.93 | 2.80 | 2.21– 2.24 | 1.77 | 1.94– 2.04 | 1.74 |
| May | 610 | 2.04– 3.12 | 1.74 | 2.28– 3.27 | 2.47 | 1.74– 2.13 | 1.69 | 1.76– 2.49 | 2.20 | 1.30 | 1.16 | 1.00– 1.15 | 1.01 |
| June | 646 | 2.87– 3.95 | 2.55 | 2.83– 4.26 | 3.16 | 2.19– 2.65 | 1.92 | 2.26– 2.90 | 2.44 | 2.83– 2.86 | 2.10 | 1.90– 1.99 | 2.29 |
| July | 722 | 2.05– 2.89 | 2.12 | 2.20– 2.98 | 2.42 | 1.74– 2.08 | 1.74 | 1.88– 2.24 | 1.91 | 2.40– 2.55 | 1.77 | 1.50– 1.58 | 1.45 |
| August | 780 | 2.64– 3.59 | 2.65 | 2.74– 3.54 | 2.82 | 2.02– 2.67 | 1.98 | 2.21– 2.56 | 2.03 | 1.80– 1.84 | 1.44 | 1.48– 1.50 | 1.47 |
| September | 714 | 3.97– 5.06 | 4.12 | 3.88– 5.16 | 4.22 | 2.71– 3.59 | 2.76 | 3.00– 3.67 | 3.06 | 2.56– 2.62 | 2.18 | 2.18– 2.21 | 2.24 |
| October | 623 | 4.74– 5.97 | 4.64 | 3.96– 5.59 | 4.60 | 3.19– 4.12 | 3.42 | 3.19– 4.10 | 3.36 | 3.00– 3.04 | 2.71 | 2.56– 2.57 | 2.39 |
| November | 538 | 3.39– 5.15 | 3.17 | 3.79– 5.47 | 4.53 | 2.54– 3.94 | 2.69 | 3.20– 4.12 | 3.46 | 2.83– 2.88 | 2.60 | 2.81 | 2.62 |
| December | 532 | 3.40– 4.37 | 2.85 | 3.51– 4.83 | 3.69 | 3.04– 3.72 | 2.69 | 2.39– 3.52 | 3.10 | 2.73– 2.82 | 2.09 | 2.04– 2.09 | 2.26 |
| Average | 571 | 3.23– 4.15 | 2.87 | 3.35– 4.49 | 3.57 | 2.59– 3.18 | 2.38 | 2.65– 3.33 | 3.07 | 2.68– 2.72 | 2.25 | 2.02– 2.13 | 1.99 |

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[1] Includes whale cod.

[2] Includes scrod cod.

[5] Includes offshore vessels and inshore craft.

[6] Includes dressed, round, and steak whiting.

[7] Includes butterfish, sharks, skates, spawn, etc.

NOTE.—Quantities shown are weigh-outs of fishery products as landed. Each classification by variety includes all sizes unless otherwise noted.

*Sales of fishery products through the New England Fish Exchange, Boston, Mass., 1939*—Continued

PRICES: BY SPECIES AND MONTHS—Continued

| Month | Flounders [3] | | | | Blackback [4] | | | | Dab [4] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Offshore vessels | | Inshore craft | | Offshore vessels | | Inshore craft | | Offshore vessels | | Inshore craft | |
| | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price |
| January | $2.75-$11.85 | $3.81 | $2.02-$5.91 | $3.32 | | | | | | | | |
| February | 4.00- 12.03 | 4.38 | 2.87- 7.37 | 4.33 | | | | | | | | |
| March | 3.32- 8.49 | 4.16 | 2.30- 6.56 | 3.70 | | | | | | | | |
| April | 2.06- 8.10 | 3.63 | 1.72- 4.15 | 2.70 | | | | | | | | |
| May | | | 1.27- 4.14 | 2.42 | $1.84-$1.92 | $1.28 | | | $1.13-$1.25 | $0.97 | | |
| June | | | 1.60- 5.27 | 3.18 | 2.71- 2.74 | 2.22 | | | 1.90- 1.93 | 1.63 | | |
| July | | | 2.43- 5.30 | 3.17 | 2.82- 2.96 | 2.52 | | | 2.55- 2.92 | 2.42 | | |
| August | | | 2.57- 6.36 | 3.08 | 3.23- 3.28 | 3.04 | | | 2.44 | 1.80 | | |
| September | | | 2.35- 6.78 | 2.88 | 3.83 | 3.72 | | | 2.50- 2.55 | 2.02 | | |
| October | | | | | 3.99- 4.05 | 3.52 | $3.68-$5.03 | $3.95 | 3.09- 3.27 | 2.51 | $2.93-$3.14 | $2.58 |
| November | | | | | 6.41- 6.53 | 5.75 | 3.86- 5.17 | 4.05 | 3.49- 3.51 | 3.00 | 3.64- 4.00 | 3.60 |
| December | | | | | 5.91- 6.00 | 5.39 | 4.40- 6.40 | 4.47 | 3.46- 3.57 | 2.63 | 2.87- 3.00 | 2.81 |
| Average | 3.03- 10.04 | 4.01 | 2.12- 5.74 | 3.06 | 3.71- 3.78 | 3.20 | 3.92- 5.41 | 4.15 | 2.50- 2.59 | 1.77 | 3.14- 3.37 | 2.81 |

| Month | Sole [4] | | | | | | | | Yellowtail [4] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gray | | | | Lemon | | | | Offshore vessels | | Inshore craft | |
| | Offshore vessels | | Inshore craft | | Offshore vessels | | Inshore craft | | | | | |
| | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price |
| January | | | | | | | | | | | | |
| February | | | | | | | | | | | | |
| March | | | | | | | | | | | | |
| April | | | | | | | | | | | | |
| May | $2.85-$2.93 | $2.52 | | | $3.56-$3.58 | $2.70 | | | $1.33-$1.40 | $0.96 | | |
| June | 4.12- 4.17 | 3.62 | | | 5.66- 5.74 | 4.53 | | | 1.86- 1.94 | 1.78 | | |
| July | 4.11- 4.25 | 3.41 | | | 7.38 | 6.78 | | | 2.07- 2.58 | 1.88 | | |
| August | 5.56 | 3.69 | | | 6.19- 6.21 | 5.34 | | | 3.14- 3.21 | 2.22 | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| September | 5.06- 5.09 | 3.89 | | | 7.61- 7.64 | 7.32 | | | 3.13- 3.20 | 2.57 | | |
| October | 5.21- 5.55 | 4.73 | $4.32- $8.33 | $6.21 | 7.14- 7.20 | 6.19 | $7.80 | $6.17 | 2.78- 3.05 | 2.32 | $2.91- $3.69 | $1.63 |
| November | 7.99- 8.27 | 7.30 | 5.47- 10.78 | 7.47 | 10.61 | 9.68 | 10.00 | 8.28 | 3.19- 3.63 | 2.40 | 3.60- 4.19 | 2.77 |
| December | 7.61- 7.70 | 6.43 | 4.31- 9.22 | 5.99 | 12.10 | 10.70 | | 2.00 | 2.70- 2.95 | 2.07 | 3.12- 3.44 | 2.15 |
| Average | 5.45- 5.59 | 4.85 | 4.66- 9.13 | 6.32 | 7.43- 7.46 | 5.79 | 8.43 | 6.58 | 2.52- 2.72 | 1.87 | 3.28- 3.86 | 1.97 |

| Month | Halibut | | | Haddock | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Large | | | | Scrod | | | |
| | Offshore vessels | | Inshore craft | Offshore vessels | | Inshore craft | | Offshore vessels | | Inshore craft | |
| | First sales prices | Average price | Average price | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price |
| January | | $20.78 | $22.65 | $4.22-$4.86 | $3.93 | $4.50-$5.09 | $5.66 | $2.99-$3.06 | $2.80 | $2.20 | $2.60 |
| February | | 16.58 | 28.78 | 3.97- 4.07 | 3.40 | 5.00- 5.42 | 5.60 | 2.65- 2.72 | 2.42 | $1.93- 1.98 | 1.94 |
| March | $13.00-$20.00 | 15.65 | 23.90 | 3.57- 3.64 | 3.17 | 4.32- 5.05 | 5.05 | 2.89- 2.93 | 2.71 | 2.60 | 2.80 |
| April | 8.00- 13.25 | 12.54 | 16.78 | 2.90- 3.15 | 2.50 | 3.68- 4.45 | 3.88 | 2.14- 2.22 | 2.03 | 2.08- 2.21 | 2.10 |
| May | 8.50- 11.50 | 9.90 | 12.13 | 2.49- 2.66 | 2.14 | 3.22- 4.51 | 3.60 | 1.95- 2.01 | 1.74 | 1.75- 1.96 | 1.83 |
| June | 9.25- 13.75 | 10.77 | 13.44 | 3.27- 3.54 | 2.93 | 3.97- 5.05 | 4.16 | 2.16 | 2.02 | 2.11- 2.48 | 2.16 |
| July | 10.25- 14.25 | 11.46 | 15.00 | 2.41- 2.79 | 2.27 | 2.89- 3.72 | 3.16 | 1.94- 1.95 | 1.74 | 1.87- 2.10 | 1.93 |
| August | 10.50- 13.00 | 12.38 | 20.75 | 2.73- 3.18 | 2.50 | 3.44- 4.39 | 4.00 | 1.88- 1.89 | 1.74 | 1.91- 1.99 | 1.89 |
| September | 10.00- 15.50 | 12.38 | 18.37 | 3.26- 3.94 | 3.13 | 4.32- 5.31 | 4.83 | 2.26- 2.29 | 2.16 | 2.23- 2.43 | 2.28 |
| October | 10.00- 16.50 | 14.07 | 16.64 | 4.39- 5.11 | 3.98 | 4.53- 5.30 | 4.64 | 2.91- 3.01 | 2.79 | 2.15- 3.03 | 2.66 |
| November | | 20.12 | 15.07 | 5.67- 6.12 | 5.11 | 5.43- 6.23 | 5.99 | 3.58- 3.86 | 3.18 | 2.42- 4.07 | 3.59 |
| December | | 20.30 | 35.59 | 4.35- 4.65 | 3.76 | 4.83- 5.35 | 5.19 | 3.11- 3.23 | 2.67 | 2.72- 3.47 | 3.02 |
| Average | 9.90- 14.58 | 12.98 | 17.23 | 3.60- 3.96 | 3.09 | 4.04- 4.91 | 4.35 | 2.54- 2.60 | 2.23 | 2.15- 2.56 | 2.36 |

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[3] Shown separately as blackbacks, dabs, gray sole, lemon sole, and yellowtails if taken by offshore vessels after April 1939 or by inshore craft after September 1939.

[4] Included under flounders if taken before May 1939 by offshore vessels or before October 1939 by inshore craft.

*Sales of fishery products through the New England Fish Exchange, Boston, Mass., 1939*—Continued

PRICES: BY SPECIES AND MONTHS—Continued

| Month | Hake | | | | Mackerel | | Pollock | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Offshore vessels | | Inshore craft | | All craft [5] | | Offshore vessels | | Inshore craft | |
| | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price |
| January | $3.63–$4.34 | $3.58 | $3.66–$3.96 | $3.64 | $1.50–$2.50 | $2.02 | $1.48–$1.60 | $1.37 | $1.34–$1.48 | $1.68 |
| February | 3.60– 4.68 | 3.56 | 4.24– 4.69 | 3.44 | ---------- | ---------- | 2.30– 2.33 | 1.94 | 2.33– 2.50 | 1.79 |
| March | 4.86– 5.66 | 4.72 | 4.37– 5.25 | 4.34 | ---------- | ---------- | 2.47 | 2.18 | 2.12 | 1.95 |
| April | 4.03– 4.87 | 3.86 | 2.99– 3.21 | 2.76 | ---------- | ---------- | 1.94– 1.95 | 1.82 | 1.75– 1.94 | 1.78 |
| May | 2.19– 2.63 | 2.36 | 1.83– 2.28 | 2.18 | 3.54– 4.82 | 3.08 | 1.64– 1.70 | 1.50 | 1.52– 1.69 | 1.60 |
| June | 2.11– 2.29 | 2.14 | 2.07– 2.64 | 2.11 | 4.50– 5.30 | 3.82 | 2.56 | 2.26 | 2.01– 2.42 | 2.14 |
| July | 1.65– 1.89 | 1.64 | 1.82– 2.13 | 1.85 | 4.90– 8.93 | 4.03 | 2.21– 2.24 | 1.87 | 1.90– 2.10 | 2.03 |
| August | 1.78– 1.99 | 1.78 | 1.82– 2.33 | 2.11 | 1.23– 6.91 | 2.60 | 2.56– 2.57 | 2.11 | 2.40– 2.55 | 2.38 |
| September | 2.28– 2.67 | 2.30 | 2.34– 2.95 | 2.83 | 1.69– 4.01 | 1.85 | 2.67 | 2.12 | 2.52– 2.63 | 2.59 |
| October | 2.65– 3.11 | 2.79 | 2.70– 3.09 | 2.83 | 4.75– 6.37 | 4.68 | 2.77– 2.84 | 2.55 | 2.46– 2.78 | 2.82 |
| November | 2.80– 3.07 | 2.81 | 2.73– 3.33 | 3.12 | 5.46– 7.40 | 3.14 | 2.16– 2.18 | 1.93 | 2.11– 2.13 | 1.96 |
| December | 3.33– 3.89 | 3.23 | 3.62– 3.99 | 3.37 | 4.92– 5.77 | 4.34 | 1.75– 1.77 | 1.64 | 1.79– 1.86 | 1.76 |
| Average | 2.90– 3.41 | 2.99 | 2.73– 3.22 | 2.68 | 3.55– 6.23 | 2.93 | 2.23– 2.26 | 1.82 | 2.08 2.25 | 1.95 |

| Month | Rosefish | | | | Swordfish | | Whiting [6] | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Offshore vessels | | Inshore craft | | Offshore vessels | | Offshore vessels | | Inshore craft | |
| | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price |
| January | $1.89–$1.90 | $1.80 | $1.91–$2.05 | $1.94 | ---------- | ---------- | $1.25 | $1.33 | $3.00 | $3.56 |
| February | 1.83– 1.84 | 1.72 | 1.72– 2.34 | 1.78 | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- |
| March | 2.09 | 1.88 | 2.04 | 1.98 | ---------- | ---------- | 5.50 | 4.46 | ---------- | 5.00 |
| April | 1.98 | 1.80 | 1.92– 1.93 | 1.90 | ---------- | ---------- | ---------- | 5.00 | 6.00 | 5.50 |
| May | 1.67– 1.77 | 1.36 | 1.52– 1.62 | 1.10 | ---------- | ---------- | 1.25 | 1.23 | $1.83– 2.29 | 1.55 |
| June | 1.21 | 1.17 | 1.20– 1.23 | 1.17 | $28.78–$37.22 | $30.44 | ---------- | .25 | 1.15– 1.67 | 1.20 |
| July | 1.34 | 1.32 | 1.12– 1.13 | 1.04 | 17.63– 27.61 | 24.47 | ---------- | .42 | 1.25– 1.29 | 1.25 |
| August | 1.22– 1.23 | 1.23 | 1.33– 1.36 | 1.12 | 12.73– 18.81 | 17.04 | ---------- | .50 | 1.24– 1.26 | 1.25 |
| September | 1.45 | 1.44 | 1.50– 1.51 | 1.44 | 15.71– 21.53 | 21.20 | ---------- | ---------- | 1.30– 1.50 | 1.38 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| October | 1.72- 1.73 | 1.70 | 1.54- 1.59 | 1.55 | 20.00- 27.33 | 25.17 | 2.00 | .82 | 1.95- 2.42 | 2.12 |
| November | 1.91- 1.97 | 1.89 | 1.74- 1.84 | 1.56 | ---- | ---- | ---- | ---- | 2.12- 2.60 | 2.40 |
| December | 1.85- 1.91 | 1.69 | 1.73- 1.86 | 1.87 | ---- | ---- | ---- | 1.50 | 2.66- 2.86 | 2.46 |
| Average | 1.73- 1.75 | 1.64 | 1.59- 1.63 | 1.39 | 17.49- 25.00 | 20.00 | 2.08 | 1.46 | 1.63- 1.93 | 1.40 |

| Month | Wolffish | | | | Scallops, sea | | Miscellaneous [7] | | All species | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Offshore vessels | | Inshore craft | | Offshore vessels | | Offshore vessels | Inshore craft | Offshore vessels | Inshore craft | All craft |
| | First sales prices | Average price | First sales prices | Average price | First sales prices | Average price | Average price | Average price | Average price | Average price | Average price |
| January | $3.55-$3.61 | $3.09 | $4.00-$5.00 | $4.02 | $13.05 | $13.05 | $8.99 | $1.48 | $3.17 | $3.26 | $3.18 |
| February | 3.70- 3.72 | 3.40 | 3.81- 3.88 | 4.46 | 15.17 | 15.24 | 7.84 | 1.90 | 2.92 | 3.48 | 2.95 |
| March | 4.29- 4.32 | 3.83 | 4.22- 4.56 | 4.38 | $15.52-15.65 | 15.62 | 9.76 | 1.94 | 3.16 | 3.37 | 3.16 |
| April | 2.58- 2.59 | 2.26 | 2.38- 2.70 | 2.77 | 12.36-12.50 | 13.87 | 7.80 | 2.78 | 2.36 | 2.63 | 2.38 |
| May | 1.71- 1.75 | 1.70 | 1.56- 1.73 | 1.71 | 11.31 | 11.19 | 4.10 | 1.55 | 2.07 | 1.90 | 2.05 |
| June | 2.51 | 2.44 | 2.42- 2.60 | 2.48 | 11.01 | 10.95 | 4.70 | 1.62 | 2.76 | 2.13 | 2.65 |
| July | 2.82 | 2.64 | 2.56- 2.61 | 2.57 | 11.42 | 11.37 | 3.89 | 1.80 | 2.54 | 1.88 | 2.42 |
| August | 3.75 | 3.41 | ---- | 2.69 | 12.49 | 12.46 | 2.65 | 1.43 | 2.81 | 1.91 | 2.69 |
| September | 4.43 | 4.22 | ---- | 2.60 | 14.18 | 14.06 | 1.81 | 2.99 | 2.95 | 2.31 | 2.86 |
| October | 4.93 | 4.46 | ---- | 2.06 | 14.81 | 14.69 | 3.10 | 2.44 | 3.46 | 2.65 | 3.34 |
| November | 5.09- 5.16 | 4.75 | ---- | 5.17 | 16.88 | 16.72 | 2.30 | 1.81 | 3.22 | 2.89 | 3.17 |
| December | 4.28- 4.33 | 4.02 | 4.00 | 1.54 | 15.03-15.16 | 14.98 | 4.91 | 1.92 | 2.93 | 2.79 | 2.92 |
| Average | 3.54- 3.56 | 2.61 | 2.57- 2.78 | 2.42 | 13.18-13.22 | 13.03 | 4.27 | 2.36 | 2.84 | 2.40 | 2.79 |

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[5] Includes offshore vessels and inshore craft.
[6] Includes dressed, round, and steak whiting.
[7] Includes butterfish, sharks, skates, spawn, etc.

NOTE.—Prices are in dollars per hundredweight. First sales prices represent an unweighted average. The average price always is weighted. Each classification by variety includes all sizes unless otherwise noted.

## VESSEL LANDINGS OF FISHERY PRODUCTS AT NEW BEDFORD, MASS.

Landings of fishery products by fishing vessels (craft of 5 net tons capacity or greater) during 1939 amounted to 23,006,463 pounds, valued at $1,343,048. The heaviest landings occurred in October, when 3,303,743 pounds were received, and the smallest landings occurred in April, when receipts amounted to 806,761 pounds. Sea scallops are particularly important in the landings at this port, being valued at $609,570, or 45 percent of the total value of the landings of all species during the year.

*Vessel landings of fishery products at New Bedford, Mass., 1939, by species and months*

| Month | Blackback | | Butterfish | | Cod | | Dab | | Eels | | Fluke | | Haddock | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| January | 71, 229 | $6, 305 | 6, 150 | $377 | 101, 794 | $4, 169 | 1, 000 | $15 | | | 1, 000 | $155 | 189, 850 | $7, 305 |
| February | 69, 229 | 8, 279 | 17, 204 | 1, 432 | 79, 520 | 2, 852 | | | 1, 125 | $17 | 6, 985 | 788 | 76, 795 | 2, 670 |
| March | 252, 481 | 17, 540 | | | 145, 165 | 5, 125 | 2, 810 | 70 | 3, 620 | 112 | 1, 500 | 180 | 171, 125 | 5, 066 |
| April | 191, 959 | 7, 602 | 625 | 38 | 15, 915 | 410 | | | | | 16 | 1 | 31, 630 | 1, 253 |
| May | 628, 640 | 11, 229 | | | 73, 180 | 1, 832 | 1, 660 | 16 | 35 | 1 | 1, 974 | 164 | 68, 310 | 1, 574 |
| June | 623, 975 | 20, 941 | 300 | 9 | 19, 285 | 387 | 360 | 3 | | | 1, 261 | 132 | 120, 830 | 3, 021 |
| July | 520, 955 | 25, 112 | 9, 580 | 325 | 101, 565 | 2, 177 | 1, 040 | 24 | | | 3, 182 | 317 | 160, 810 | 3, 524 |
| August | 277, 291 | 19, 325 | 1, 825 | 49 | 60, 545 | 1, 311 | 315 | 6 | | | 12, 721 | 1, 242 | 123, 335 | 2, 596 |
| September | 242, 263 | 13, 217 | 3, 355 | 52 | 123, 915 | 3, 557 | | | 100 | 1 | 14, 477 | 1, 425 | 54, 800 | 1, 379 |
| October | 492, 998 | 29, 748 | 21, 170 | 654 | 300, 282 | 11, 065 | 375 | 7 | 165 | 5 | 35, 916 | 3, 566 | 142, 105 | 5, 226 |
| November | 205, 250 | 12, 752 | 63, 767 | 2, 069 | 311, 500 | 11, 452 | | | 3, 955 | 70 | 1, 591 | 152 | 247, 749 | 8, 782 |
| December | 146, 065 | 9, 609 | 65, 040 | 2, 621 | 176, 208 | 5, 992 | | | 140 | 2 | 108 | 6 | 167, 035 | 5, 316 |
| Total | 3, 722, 335 | 181, 659 | 189, 016 | 7, 626 | 1, 508, 874 | 50, 329 | 7, 560 | 141 | 9, 140 | 208 | 80, 731 | 8, 128 | 1, 554, 374 | 47, 712 |

| Month | Hake | | Halibut | | Mackerel | | Pollock | | Rosefish | | Scup | | Sole, gray | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| January | 1, 090 | $33 | | | 269, 330 | $12, 178 | 1, 200 | $12 | 33, 200 | $544 | | | 90 | $4 |
| February | 31, 105 | 646 | | | | | 115 | 3 | | | 720 | $12 | 155 | 9 |
| March | 50 | 2 | 105 | $12 | | | | | | | 4, 000 | 220 | 590 | 17 |
| April | 285 | 6 | 90 | 11 | | | | | | | 125 | 8 | 145 | 3 |
| May | 10, 905 | 181 | 275 | 28 | 642, 050 | 18, 597 | 6, 120 | 96 | 100 | 1 | | | 4, 795 | 125 |
| June | 6, 945 | 142 | 637 | 68 | 622, 305 | 19, 994 | 50 | 2 | | | | | 560 | 13 |
| July | 3, 450 | 56 | 58 | 8 | 101, 780 | 5, 281 | 125 | 1 | | | | | 770 | 27 |
| August | 2, 940 | 52 | | | 112, 750 | 5, 239 | | | | | 275 | 3 | 275 | 8 |
| September | 5, 305 | 119 | | | 438, 525 | 18, 048 | 3, 350 | 48 | | | 3, 390 | 56 | | |
| October | 13, 019 | 224 | | | 331, 150 | 15, 480 | 2, 235 | 36 | | | 3, 730 | 109 | | |
| November | 3, 620 | 89 | 288 | 56 | 327, 013 | 9, 712 | 61, 595 | 1, 229 | | | 1, 795 | 68 | | |
| December | 745 | 18 | 142 | 28 | 410, 780 | 13, 191 | 74, 265 | 1, 447 | | | 2, 145 | 128 | | |
| Total | 79, 459 | 1, 568 | 1, 595 | 211 | 3, 255, 683 | 117, 720 | 149, 055 | 2, 874 | 33, 300 | 545 | 16, 180 | 604 | 7, 380 | 206 |

*Vessel landings of fishery products at New Bedford, Mass., 1939, by species and months*—Continued

| Month | Sole, lemon | | Swordfish | | Tilefish | | Tuna | | Whiting | | Wolffish | | Yellowtail | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| January | 114, 000 | $14, 320 | | | | | | | | | 100 | $3 | 1, 071, 520 | $23, 887 |
| February | 30, 664 | 3, 437 | | | 10, 225 | $465 | | | | | | | 1, 074, 125 | 32, 118 |
| March | 39, 800 | 2, 895 | | | 38, 725 | 2, 095 | | | 4, 000 | $100 | | | 1, 074, 980 | 27, 493 |
| April | 54, 220 | 3, 199 | | | | | | | 200 | 3 | | | 488, 110 | 13, 855 |
| May | 119, 810 | 4, 236 | 1, 600 | $444 | | | | | 1, 200 | 24 | 3, 130 | 24 | 431, 020 | 4, 805 |
| June | 18, 125 | 890 | 11, 512 | 3, 899 | | | | | | | 250 | 3 | 241, 661 | 3, 388 |
| July | 31, 640 | 2, 717 | 55, 328 | 12, 503 | | | | | | | | | 421, 178 | 5, 460 |
| August | 56, 135 | 4, 874 | 55, 088 | 10, 313 | | | | | | | | | 581, 780 | 9, 190 |
| September | 47, 715 | 3, 931 | 1, 508 | 262 | | | 10, 700 | $1, 242 | | | | | 1, 329, 800 | 18, 553 |
| October | 257, 740 | 24, 850 | | | | | | | 5, 480 | 73 | | | 1, 615, 753 | 20, 871 |
| November | 127, 225 | 12, 957 | 330 | 12 | | | | | 3, 605 | 41 | | | 1, 054, 222 | 17, 997 |
| December | 35, 200 | 3, 280 | 3, 000 | 105 | | | | | 2, 375 | 24 | | | 1, 335, 820 | 22, 941 |
| Total | 932, 274 | 81, 586 | 128, 366 | 27, 538 | 48, 950 | 2, 560 | 10, 700 | 1, 242 | 16, 860 | 265 | 3, 480 | 30 | 10, 719, 969 | 200, 558 |

| Month | Spawn | | Miscellaneous [1] | | Total fish | | Scallops, sea | | Squid | | Total shellfish | | Grand total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| January | | | 100 | $8 | 1, 861, 653 | $69, 315 | 41, 308 | $49, 144 | | | 41, 308 | $49, 144 | 1, 902, 961 | $118, 459 |
| February | 585 | $29 | 483 | 17 | 1, 399, 035 | 52, 774 | 26, 814 | 27, 572 | 220 | $5 | 27, 034 | 27, 577 | 1, 426, 069 | 80, 351 |
| March | | | 685 | 12 | 1, 739, 636 | 60, 939 | 41, 723 | 53, 872 | | | 41, 723 | 53, 872 | 1, 781, 359 | 114, 811 |
| April | | | 45 | 1 | 783, 365 | 26, 390 | 23, 276 | 25, 403 | 120 | 4 | 23, 396 | 25, 407 | 806, 761 | 51, 797 |
| May | | | 925 | 26 | 1, 995, 729 | 43, 403 | 49, 208 | 46, 527 | | | 49, 208 | 46, 527 | 2, 044, 937 | 89, 930 |
| June | | | 85 | 3 | 1, 668, 141 | 52, 895 | 36, 863 | 34, 458 | | | 36, 863 | 34, 458 | 1, 705, 004 | 87, 353 |
| July | | | | | 1, 411, 461 | 57, 532 | 37, 106 | 35, 515 | 40 | 1 | 37, 146 | 35, 516 | 1, 448, 607 | 93, 048 |
| August | | | | | 1, 285, 275 | 54, 208 | 49, 111 | 50, 768 | | | 49, 111 | 50, 768 | 1, 334, 386 | 104, 976 |
| September | | | | | 2, 279, 203 | 61, 890 | 60, 081 | 74, 785 | | | 60, 081 | 74, 785 | 2, 339, 284 | 136, 675 |
| October | | | 43 | 3 | 3, 222, 161 | 111, 917 | 80, 837 | 103, 498 | 745 | 22 | 81, 582 | 103, 520 | 3, 303, 743 | 215, 437 |
| November | | | 105 | 8 | 2, 413, 610 | 77, 446 | 42, 004 | 59, 619 | 880 | 19 | 42, 884 | 59, 638 | 2, 456, 494 | 137, 084 |
| December | | | 130 | 8 | 2, 419, 198 | 64, 716 | 37, 540 | 48, 409 | 120 | 2 | 37, 660 | 48, 411 | 2, 456, 858 | 113, 127 |
| Total | 585 | 29 | 2, 601 | 86 | 22, 478, 467 | 733, 425 | 525, 871 | 609, 570 | 2, 125 | 53 | 527, 996 | 609, 623 | 23, 006, 463 | 1, 343, 048 |

[1] Includes rays, sea bass, gray sea trout, or weakfish, shad, sharks, and skates.

NOTE.—Volume of catch is shown in weights as landed which may be in the round or dressed condition. Data for sea scallops are shown in pounds of meats.

## MACKEREL FISHERY OF THE ATLANTIC COAST[7]

The mackerel season of 1938 extended from March 26, 1938, to January 24, 1939. One hundred and two vessels landed 29,844,100 pounds, an increase of 113 percent as compared with corresponding landings of the preceding year.

In this analysis, vessels include United States craft of 5 net tons capacity or over. Most of them are registered in Massachusetts. Purse seiners are classed as "regular" or "irregular" on the basis of their effort throughout the whole mackerel season. Regular seiners fished in all three major areas, and were active for more than two-thirds the duration of the Gulf of Maine fishery. Irregular seiners did not fish in the southern area, or ceased seining activity for 3 months or more during the time of the Gulf of Maine fishery. Vessels using purse seines may change gear and crew and engage in netting for a portion of the season, and during this time they are classed as netters. Allowance for such duplication has been made in the summary "Operating Units and Catch."

*Mackerel fishery of the Atlantic coast, 1938*[1]

CATCH: BY AREAS IN 5-DAY PERIODS

| Date | South (area XXIII) | | Block Island (area XXII west of Nantucket Shoals) | | Gulf of Maine (area XXII north of Nantucket Shoals) | | Nova Scotia (area XXI) | Total |
|---|---|---|---|---|---|---|---|---|
| | Seiners | Netters | Seiners | Netters | Seiners | Netters | Seiners | |
| SPRING | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Mar. 26-31 | 11,800 | | | | | | | 11,800 |
| Apr. 1-5 | 36,900 | | | | | | | 36,900 |
| Apr. 6-10 | 26,600 | | | | | | | 26,600 |
| Apr. 11-15 | 15,400 | 31,800 | | | | | | 47,200 |
| Apr. 16-20 | 284,600 | 156,500 | | | | | | 441,100 |
| Apr. 21-25 | 914,000 | 46,400 | | | | | | 960,400 |
| Apr. 26-30 | 1,003,100 | 8,100 | | | | | | 1,011,200 |
| May 1-5 | 1,261,700 | 57,300 | 39,600 | | | | | 1,358,600 |
| May 6-10 | 2,060,000 | 51,800 | 102,000 | 9,700 | | | | 2,223,500 |
| May 11-15 | 460,300 | 106,600 | 435,200 | 14,300 | | | | 1,016,400 |
| May 16-20 | 365,300 | 20,900 | 544,500 | 5,900 | | 500 | | 937,100 |
| May 21-25 | 118,600 | 12,400 | 1,380,400 | 3,800 | | | | 1,515,200 |
| May 26-31 | | 1,300 | 924,900 | | | | 60,000 | 986,200 |
| June 1-5 | | | 351,400 | 5,600 | 8,700 | 200 | 29,700 | 395,600 |
| June 6-10 | | 1,700 | 9,000 | 600 | 54,900 | 8,400 | 250,100 | 324,700 |
| June 11-15 | | | | | 1,391,200 | 2,900 | 16,700 | 1,410,800 |
| June 16-20 | | | | | 1,222,200 | 2,200 | | 1,224,400 |
| June 21-25 | | | | | 345,800 | 3,400 | | 349,200 |
| June 26-30 | | | | | 110,200 | 100 | | 110,300 |
| SUMMER | | | | | | | | |
| July 1-5 | | | | | 1,384,300 | | | 1,384,300 |
| July 6-10 | | | | | 401,900 | | | 401,900 |
| July 11-15 | | | | | 277,600 | | | 277,600 |
| July 16-20 | | | | | 1,033,500 | | | 1,033,500 |
| July 21-25 | | | | | 2,209,000 | | | 2,209,000 |
| July 26-31 | | | | | 374,700 | | | 374,700 |
| Aug. 1-5 | | | | | 583,000 | | | 583,000 |
| Aug. 6-10 | | | | | 164,500 | | | 164,500 |
| Aug. 11-15 | | | | | 163,400 | | | 163,400 |
| Aug. 16-20 | | | | | 555,900 | | | 555,900 |

[1] Includes the catch made during the mackerel season, which extended from Mar. 26, 1938, to Jan. 24, 1939.

[7] This section, prepared by J. R. Webster of the Division of Scientific Inquiry, includes landings at Cape May, Wildwood, and Atlantic City, N. J.; New York City, N. Y.; Newport and Block Island, R. I.; New Bedford, Woods Hole, Nantucket, Provincetown, Plymouth, Scituate, Boston, and Gloucester, Mass.; Portland, Rockland, New Harbor, Vinal Haven, Boothbay, and Monhegan, Maine, by purse seine vessels or "seiners" and drift-gill-net vessels or "netters." It does not include incidental catches by other vessels such as menhaden steamers, otter trawlers, line trawlers, etc., or by traps. The figures will differ somewhat from statistics published elsewhere in this document, due to different methods of collecting and tabulating the material.

*Mackerel fishery of the Atlantic coast, 1938*—Continued

CATCH: BY AREAS IN 5-DAY PERIODS—Continued

| Date | South (area XXIII) | | Block Island (area XXII west of Nantucket Shoals) | | Gulf of Maine (area XXII north of Nantucket Shoals) | | Nova Scotia (area XXI) | Total |
|---|---|---|---|---|---|---|---|---|
| | Seiners | Netters | Seiners | Netters | Seiners | Netters | Seiners | |
| SUMMER—continued | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Aug. 21-25 | -------- | -------- | -------- | -------- | 611,700 | -------- | -------- | 611,700 |
| Aug. 26-31 | -------- | -------- | -------- | -------- | 850,600 | -------- | -------- | 850,600 |
| Sept. 1-5 | -------- | -------- | -------- | -------- | 138,000 | -------- | -------- | 138,000 |
| Sept. 6-10 | -------- | -------- | -------- | -------- | 81,800 | 3,600 | -------- | 85,400 |
| Sept. 11-15 | -------- | -------- | -------- | -------- | 638,900 | 3,100 | -------- | 642,000 |
| Sept. 16-20 | -------- | -------- | -------- | -------- | 129,700 | -------- | -------- | 129,700 |
| Sept. 21-25 | -------- | -------- | -------- | -------- | 9,300 | -------- | -------- | 9,300 |
| Sept. 26-30 | -------- | -------- | -------- | -------- | 6,700 | 1,300 | -------- | 8,000 |
| FALL AND WINTER | | | | | | | | |
| Oct. 1-5 | -------- | -------- | -------- | -------- | 2,100 | 100 | -------- | 2,200 |
| Oct. 6-10 | -------- | -------- | -------- | -------- | -------- | 300 | -------- | 300 |
| Oct. 11-15 | -------- | -------- | 91,200 | -------- | 3,400 | -------- | -------- | 94,600 |
| Oct. 16-20 | -------- | -------- | 1,187,100 | -------- | 800 | 400 | -------- | 1,188,300 |
| Oct. 21-25 | 520,200 | -------- | 372,800 | -------- | -------- | 500 | -------- | 893,500 |
| Oct. 26-31 | -------- | -------- | 128,700 | -------- | 2,000 | -------- | -------- | 130,700 |
| Nov. 1-5 | 90,600 | -------- | -------- | -------- | -------- | 24,900 | -------- | 115,500 |
| Nov. 6-10 | -------- | -------- | -------- | -------- | -------- | 70,600 | -------- | 70,600 |
| Nov. 11-15 | 20,200 | -------- | 75,400 | -------- | -------- | 28,600 | -------- | 124,200 |
| Nov. 16-20 | 1,100 | -------- | 35,400 | -------- | 61,600 | 4,300 | -------- | 102,400 |
| Nov. 21-25 | 299,100 | -------- | 63,300 | -------- | 22,700 | 12,000 | -------- | 397,100 |
| Nov. 26-30 | -------- | -------- | 500 | -------- | -------- | 2,400 | -------- | 2,900 |
| Dec. 1-5 | -------- | -------- | 111,400 | -------- | -------- | 62,500 | -------- | 173,900 |
| Dec. 6-10 | -------- | -------- | -------- | -------- | -------- | 32,300 | -------- | 32,300 |
| Dec. 11-15 | -------- | 2,400 | -------- | -------- | 1,116,500 | 71,500 | -------- | 1,190,400 |
| Dec. 16-20 | -------- | -------- | -------- | -------- | 803,900 | 24,800 | -------- | 828,700 |
| Jan. 16-20 | -------- | -------- | 149,100 | -------- | -------- | -------- | -------- | 149,100 |
| Jan. 21-25 | 28,000 | -------- | 309,700 | -------- | -------- | -------- | -------- | 337,700 |
| Total | 7,517,500 | 497,200 | 6,311,600 | 39,900 | 14,760,500 | 360,900 | 356,500 | 29,844,100 |

NOTE.—The roman numerals appearing in the box heads of the above table refer to the numbers given these areas by the North American Council on Fishery Investigations.

OPERATING UNITS AND CATCH: BY GEAR CLASSIFICATION AND GROUNDS

[Vessels of 5 net tons and over]

| Designation | Vessels | Tonnage | Crew | Trips | Catch | |
|---|---|---|---|---|---|---|
| SPRING PERIOD | | | | | | |
| South (area XXIII) | | | | | | |
| Seiners: | *Number* | *Net tons* | *Number* | *Number* | *Pounds* | *Value* |
| Regular | 30 | 1,263 | 392 | 212 | 5,166,200 | $129,816 |
| Irregular | 15 | 590 | 195 | 70 | 1,392,100 | 31,422 |
| Netters | 22 | 340 | 134 | 138 | 494,800 | 20,917 |
| Block Island (area XXII—West of Nantucket Shoals) | | | | | | |
| Seiners: | | | | | | |
| Regular | 30 | 1,263 | 392 | 98 | 2,944,500 | 63,442 |
| Irregular | 14 | 545 | 183 | 37 | 842,500 | 18,642 |
| Netters | 8 | 125 | 49 | 16 | 39,900 | 760 |
| Gulf of Maine (area XXII—East of Nantucket Shoals) | | | | | | |
| Seiners: | | | | | | |
| Regular | 29 | 1,198 | 378 | 113 | 2,433,100 | 49,969 |
| Irregular | 22 | 572 | 218 | 59 | 699,900 | 13,825 |
| Netters | 4 | 40 | 18 | 22 | 17,700 | 737 |
| Nova Scotia (areaXXI) | | | | | | |
| Seiners: | | | | | | |
| Regular | 5 | 269 | 68 | 7 | 272,500 | 13,381 |

## *Mackerel fishery of the Atlantic coast, 1938*—Continued

OPERATING UNITS AND CATCH: BY GEAR CLASSIFICATION AND GROUNDS

| Designation | Vessels | Tonnage | Crew | Trips | Catch | |
|---|---|---|---|---|---|---|
| SPRING PERIOD—continued | | | | | | |
| Nova Scotia—Continued | | | | | | |
| Seiners—Continued | *Number* | *Net tons* | *Number* | *Number* | *Pounds* | *Value* |
| Irregular | 2 | 59 | 29 | 2 | 84, 000 | $3, 511 |
| Total by gear: | | | | | | |
| Seiners: | | | | | | |
| Regular | 30 | 1, 263 | 392 | 430 | 10, 816, 300 | 256, 608 |
| Irregular | 31 | 763 | 297 | 168 | 3, 018, 500 | 67, 400 |
| Netters | 26 | 388 | 151 | 176 | 552, 400 | 22, 414 |
| Total spring | [1] 84 | [1] 2, 373 | [1] 823 | 774 | 14, 387, 200 | 346, 422 |
| SUMMER PERIOD | | | | | | |
| Gulf of Maine (area XXII—East of Nantucket Shoals) | | | | | | |
| Seiners: | | | | | | |
| Regular | 30 | 1, 263 | 392 | 515 | 7, 712, 000 | 205, 497 |
| Irregular | 31 | 763 | 297 | 229 | 1, 902, 500 | 51, 620 |
| Netters | 5 | 47 | 25 | 16 | 8, 000 | 575 |
| Total summer | [1] 64 | [1] 2, 050 | [1] 704 | 760 | 9, 622, 500 | 257, 692 |
| FALL AND WINTER PERIOD | | | | | | |
| South (area XXIII) | | | | | | |
| Seiners: | | | | | | |
| Regular | 24 | 1, 071 | 336 | 45 | 682, 700 | 34, 254 |
| Irregular | 9 | 393 | 119 | 16 | 276, 500 | 11, 715 |
| Netters | 1 | 15 | 7 | 1 | 2, 400 | 170 |
| Block Island (area XXII) | | | | | | |
| Seiners: | | | | | | |
| Regular | 29 | 1, 244 | 405 | 107 | 2, 147, 900 | 98, 884 |
| Irregular | 8 | 340 | 112 | 21 | 376, 700 | 15, 971 |
| Gulf of Maine (area XXII—East of Nantucket Shoals) | | | | | | |
| Seiners: | | | | | | |
| Regular | 25 | 1, 071 | 346 | 51 | 1, 426, 200 | 70, 337 |
| Irregular | 13 | 388 | 131 | 24 | 586, 800 | 26, 146 |
| Netters | 28 | 477 | 190 | 204 | 335, 200 | 23, 594 |
| Total by gear: | | | | | | |
| Seiners: | | | | | | |
| Regular | 30 | 1, 263 | 416 | 203 | 4, 256, 800 | 203, 475 |
| Irregular | 16 | 528 | 172 | 61 | 1, 240, 000 | 53, 832 |
| Netters | 28 | 477 | 190 | 205 | 337, 600 | 23, 764 |
| Total fall and winter | [1] 72 | [1] 2, 232 | [1] 762 | 469 | 5, 834, 400 | 281, 071 |
| SEASON OF 1938 | | | | | | |
| Seiners: | | | | | | |
| Regular | 30 | 1, 263 | 392 | 1, 148 | 22, 785, 100 | 665, 580 |
| Irregular | 37 | 1, 008 | 375 | 458 | 6, 161, 000 | 172, 852 |
| Netters | 43 | 716 | 291 | 397 | 898, 000 | 46, 753 |
| Grand total | [1] 102 | [1] 2, 846 | [1] 1, 006 | 2, 003 | 29, 844, 100 | 885, 185 |

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[1] Exclusive of duplication. Eight vessels engaged in both seining and netting during 1938.

NOTE.—The roman numerals appearing in the stub of the above table refer to the numbers given these regions by the North American Council on Fishery Investigations.

## FISHERIES OF THE MIDDLE ATLANTIC STATES

(Area XXIII)[8]

The yield of the commercial fisheries of the Middle Atlantic States (New York, New Jersey, Pennsylvania, and Delaware) during 1938 amounted to 216,858,500 pounds valued at $8,249,244 to the fishermen, representing a decrease of 18 percent in volume but an increase of 4 percent in value as compared with the catch in 1937. These fisheries gave employment to 7,549 fishermen, as compared with 7,720 in 1937.

There were 383 fishery wholesale and manufacturing establishments in these States in 1938, as compared with 419 in the previous year. In 1938 these establishments employed 6,196 persons, paid $7,413,363 in salaries and wages, and produced manufactured products (canned, cured, packaged, and byproducts), valued at $15,435,934. In 1937 the wholesale and manufacturing firms employed 6,839 persons, paid $8,611,693 in salaries and wages, and produced manufactured products valued at $18,658,605.

*Fisheries of the Middle Atlantic States, 1938*

SUMMARY OF CATCH

| Product | New York | | New Jersey | | Pennsylvania | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Fish | 72, 737, 500 | $2, 206, 117 | 92, 052, 700 | $1, 513, 836 | 39, 800 | $4, 294 |
| Shellfish, etc | 18, 479, 500 | 2, 986, 716 | 16, 042, 200 | 1, 394, 425 | ---------- | ---------- |
| Total | 91, 217, 000 | 5, 192, 833 | 108, 094, 900 | 2, 908, 261 | 39, 800 | 4, 294 |

| Product | Delaware | | Total | |
|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* |
| Fish | 16, 984, 100 | $103, 239 | 181, 814, 100 | $3, 827, 486 |
| Shellfish, etc | 522, 700 | 40, 617 | 35, 044, 400 | 4, 421, 758 |
| Total | 17, 506, 800 | 143, 856 | 216, 858, 500 | 8, 249, 244 |

OPERATING UNITS: BY STATES

| Item | New York | New Jersey | Pennsylvania | Delaware | Total |
|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 1, 032 | 1, 097 | ---------- | 228 | 2, 357 |
| On boats and shore: | | | | | |
| Regular | 970 | 997 | ---------- | 31 | 1, 998 |
| Casual | 1, 367 | 1, 517 | 31 | 279 | 3, 194 |
| Total | 3, 369 | 3, 611 | 31 | 538 | 7, 549 |
| Vessels: | | | | | |
| Steam | 1 | ---------- | ---------- | 6 | 7 |
| Net tonnage | 45 | ---------- | ---------- | 839 | 884 |
| Motor | 205 | 186 | ---------- | 7 | 398 |
| Net tonnage | 3, 952 | 2, 863 | ---------- | 136 | 6, 951 |
| Sail | 1 | 3 | ---------- | ---------- | 4 |
| Net tonnage | 6 | 30 | ---------- | ---------- | 36 |
| Total vessels | 207 | 189 | ---------- | 13 | 409 |
| Total net tonnage | 4, 003 | 2, 893 | ---------- | 975 | 7, 871 |

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[8] This is the number given to this area by the North American Council on Fishery Investigations. It should be explained that there are included in this area craft whose principal fishing ports are in the area but at times fish elsewhere. A notable example is the southern trawl fishery which extends into area XXIV. It should be observed that the persons engaged, gear and craft employed, and catch of the seed-oyster fishery are not included among the statistics of the fishery for market oysters and other species but are shown in separate tables in this section.

### *Fisheries of the Middle Atlantic States, 1938*—Continued

OPERATING UNITS: BY STATES—Continued

| Item | New York | New Jersey | Pennsylvania | Delaware | Total |
|---|---|---|---|---|---|
| Boats: | *Number* | *Number* | *Number* | *Number* | *Number* |
| Motor | 717 | 889 | ---------- | 25 | 1,631 |
| Other | 1,042 | 1,268 | 11 | 121 | 2,442 |
| Accessory boats | 50 | 55 | ---------- | 6 | 111 |
| Apparatus: | | | | | |
| Purse seines: | | | | | |
| Mackerel | 4 | ---------- | ---------- | ---------- | 4 |
| Length, yards | 1,390 | ---------- | ---------- | ---------- | 1,390 |
| Menhaden | 8 | 4 | ---------- | 6 | 18 |
| Length, yards | 3,130 | 1,150 | ---------- | 3,666 | 7,946 |
| Other | ---------- | 10 | ---------- | ---------- | 10 |
| Length, yards | ---------- | 3,390 | ---------- | ---------- | 3,390 |
| Haul seines | 60 | 105 | 10 | 36 | 211 |
| Length, yards | 11,852 | 9,934 | 1,705 | 8,350 | 31,841 |
| Gill nets: | | | | | |
| Anchor | ---------- | 40 | ---------- | ---------- | 40 |
| Square yards | ---------- | 20,400 | ---------- | ---------- | 20,400 |
| Drift | 473 | 880 | ---------- | 25 | 1,378 |
| Square yards | 808,651 | 558,407 | ---------- | 44,540 | 1,411,598 |
| Runaround | 4 | 66 | ---------- | 8 | 78 |
| Square yards | 13,640 | 244,510 | ---------- | 3,760 | 261,910 |
| Stake | 709 | 1,371 | ---------- | 18 | 2,098 |
| Square yards | 95,796 | 354,865 | ---------- | 9,337 | 459,998 |
| Lines: | | | | | |
| Hand | 128 | 260 | ---------- | 11 | 399 |
| Hooks | 132 | 425 | ---------- | 22 | 579 |
| Trawl | 2,148 | 474 | ---------- | 3 | 2,625 |
| Hooks | 153,750 | 274,300 | ---------- | 8,400 | 436,450 |
| Troll | ---------- | 340 | ---------- | ---------- | 340 |
| Hooks | ---------- | 340 | ---------- | ---------- | 340 |
| Trot with baits or snoods | 59 | 24 | ---------- | ---------- | 83 |
| Baits or snoods | 31,400 | 21,150 | ---------- | ---------- | 52,550 |
| Trot with hooks | 19 | ---------- | ---------- | ---------- | 19 |
| Hooks | 3,750 | ---------- | ---------- | ---------- | 3,750 |
| Pound nets | 125 | 175 | ---------- | 13 | 313 |
| Weirs | ---------- | 99 | ---------- | ---------- | 99 |
| Stop nets | ---------- | 61 | ---------- | 7 | 68 |
| Square yards | ---------- | 60,700 | ---------- | 1,230 | 61,930 |
| Fyke nets | 396 | 814 | ---------- | 206 | 1,416 |
| Dip nets | 91 | 106 | ---------- | 64 | 261 |
| Cast nets | ---------- | 3 | ---------- | ---------- | 3 |
| Drag nets | 20 | ---------- | ---------- | ---------- | 20 |
| Yards at mouth | 40 | ---------- | ---------- | ---------- | 40 |
| Drop nets | ---------- | 1 | ---------- | ---------- | 1 |
| Otter trawls: | | | | | |
| Fish | 152 | 63 | ---------- | ---------- | 215 |
| Yards at mouth | 3,617 | 1,452 | ---------- | ---------- | 5,069 |
| Wire baskets | ---------- | 3 | ---------- | ---------- | 3 |
| Pots: | | | | | |
| Crab | ---------- | 10 | ---------- | ---------- | 10 |
| Eel | 2,014 | 1,244 | ---------- | 271 | 3,529 |
| Fish | 1,210 | 9,505 | ---------- | ---------- | 10,715 |
| Lobster | 10,150 | 6,075 | ---------- | 98 | 16,323 |
| Harpoons | 17 | ---------- | ---------- | ---------- | 17 |
| Spears | 70 | 12 | ---------- | ---------- | 82 |
| Dredges: | | | | | |
| Clam | 32 | 65 | ---------- | 8 | 105 |
| Yards at mouth | 52 | 68 | ---------- | 10 | 130 |
| Crab | 2 | 64 | ---------- | 8 | 74 |
| Yards at mouth | 4 | 98 | ---------- | 9 | 111 |
| Mussel | 8 | ---------- | ---------- | ---------- | 8 |
| Yards at mouth | 14 | ---------- | ---------- | ---------- | 14 |
| Oyster: | | | | | |
| Common | 76 | 198 | ---------- | 10 | 284 |
| Yards at mouth | 111 | 245 | ---------- | 11 | 367 |
| Suction | 1 | ---------- | ---------- | ---------- | 1 |
| Yards at mouth | 2 | ---------- | ---------- | ---------- | 2 |
| Scallop | 52 | 4 | ---------- | ---------- | 56 |
| Yards at mouth | 187 | 14 | ---------- | ---------- | 201 |
| Tongs: | | | | | |
| Oyster | 180 | 166 | ---------- | ---------- | 346 |
| Other | 1,298 | 504 | ---------- | 2 | 1,804 |
| Rakes: | | | | | |
| Oyster | ---------- | 33 | ---------- | ---------- | 33 |
| Other | 325 | 768 | ---------- | ---------- | 1,093 |
| Forks | 369 | 1 | ---------- | ---------- | 370 |
| Hoes | ---------- | 232 | ---------- | ---------- | 232 |

## *Fisheries of the Middle Atlantic States, 1938*—Continued

### CATCH: BY STATES

| Species | New York | | New Jersey | | Pennsylvania | | Delaware | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 66, 400 | $655 | 8, 100 | $121 | | | 47, 300 | $951 | 121, 800 | $1, 727 |
| Amberjack | | | 800 | 16 | | | | | 800 | 16 |
| Anchovies | 9, 600 | 288 | | | | | | | 9, 600 | 288 |
| Bluefish | 249, 600 | 28, 938 | 1, 038, 300 | 81, 378 | | | 3, 000 | 210 | 1, 290, 900 | 110, 526 |
| Bonito | 111, 300 | 5, 551 | 693, 900 | 25, 357 | | | | | 805, 200 | 30, 908 |
| Butterfish | 4, 495, 200 | 170, 512 | 4, 103, 500 | 135, 512 | | | | | 8, 598, 700 | 306, 024 |
| Carp | 205, 300 | 10, 387 | 383, 700 | 29, 271 | 2, 800 | $189 | 35, 800 | 2, 860 | 627, 600 | 42, 707 |
| Catfish and bullheads | 36, 100 | 5, 348 | 120, 600 | 5, 595 | | | 25, 100 | 757 | 181, 800 | 11, 700 |
| Cod | 8, 538, 600 | 393, 401 | 2, 252, 400 | 74, 358 | | | 57, 300 | 1, 732 | 10, 848, 300 | 469, 491 |
| Croaker | 400 | 12 | 5, 759, 000 | 69, 358 | | | 228, 100 | 2, 713 | 5, 987, 500 | 72, 083 |
| Cunner | 2, 300 | 46 | | | | | | | 2, 300 | 46 |
| Cusk | 100 | 2 | | | | | | | 100 | 2 |
| Drum: | | | | | | | | | | |
| Black | | | 1, 500 | 21 | | | | | 1, 500 | 21 |
| Red or redfish | | | 5, 200 | 52 | | | | | 5, 200 | 52 |
| Eels: | | | | | | | | | | |
| Common | 219, 400 | 13, 316 | 129, 300 | 13, 941 | | | 27, 200 | 3, 899 | 375, 900 | 31, 156 |
| Conger | 11, 400 | 216 | 26, 500 | 309 | | | | | 37, 900 | 525 |
| Flounders: | | | | | | | | | | |
| Gray sole | 51, 800 | 3, 365 | 1, 900 | 37 | | | | | 53, 700 | 3, 402 |
| Lemon sole | 613, 300 | 47, 980 | 26, 600 | 1, 548 | | | | | 639, 900 | 49, 528 |
| Yellowtail and dab | 3, 010, 600 | 66, 695 | 301, 800 | 5, 139 | | | | | 3, 312, 400 | 71, 834 |
| Blackback | 6, 149, 100 | 294, 647 | 181, 400 | 6, 275 | | | | | 6, 330, 500 | 300, 922 |
| Fluke | 2, 452, 100 | 208, 809 | 2, 083, 100 | 167, 632 | | | 3, 100 | 208 | 4, 538, 300 | 376, 649 |
| Unclassified | 33, 500 | 1, 665 | | | | | | | 33, 500 | 1, 665 |
| Frigate mackerel | 11, 500 | 232 | 61, 000 | 614 | | | | | 72, 500 | 846 |
| Gizzard shad | | | | | | | 400 | 12 | 400 | 12 |
| Goosefish | | | 2, 500 | 25 | | | | | 2, 500 | 25 |
| Grayfish | 300 | 5 | 101, 900 | 1, 016 | | | | | 102, 200 | 1, 021 |
| Groupers | 4, 500 | 225 | 12, 600 | 370 | | | | | 17, 100 | 595 |
| Haddock | 11, 107, 400 | 414, 254 | 1, 500 | 14 | | | | | 11, 108, 900 | 414, 268 |
| Hake | 323, 800 | 7, 999 | 41, 100 | 820 | | | | | 364, 900 | 8, 819 |
| Halibut | 47, 800 | 5, 977 | | | | | | | 47, 800 | 5, 977 |
| Herring, sea | 14, 400 | 287 | 1, 160, 800 | 6, 548 | | | | | 1, 175, 200 | 6, 835 |
| Hickory shad | 2, 300 | 40 | 27, 000 | 198 | | | | | 29, 300 | 238 |
| Kingfish or "king mackerel" | 40, 100 | 2, 191 | 100, 000 | 3, 000 | | | | | 140, 100 | 5, 191 |
| King whiting or "kingfish" | 2, 300 | 55 | 102, 500 | 4, 147 | | | | | 104, 800 | 4, 202 |
| Launce | | | 100 | 3 | | | | | 100 | 3 |
| Mackerel | 1, 786, 200 | 65, 363 | 2, 136, 400 | 83, 133 | | | | | 3, 922, 600 | 148, 496 |
| Menhaden | 22, 632, 600 | 102, 597 | 48, 101, 000 | 164, 246 | | | 16, 207, 000 | 72, 990 | 86, 940, 600 | 339, 833 |
| Mullet | | | 200 | 2 | | | 84, 700 | 3, 388 | 84, 900 | 3, 390 |
| Pollock | 305, 700 | 5, 746 | 101, 200 | 2, 152 | | | | | 406, 900 | 7, 898 |
| Sand perch | | | 1, 100 | 12 | | | | | 1, 100 | 12 |
| Scup | 2, 491, 900 | 61, 814 | 4, 950, 300 | 60, 829 | | | | | 7, 442, 200 | 122, 643 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sea bass | 284, 700 | 22, 163 | 1, 964, 400 | 104, 187 | | | | | 2, 249, 100 | 126, 350 |
| Sea robin | 11, 700 | 231 | 73, 200 | 754 | | | | | 84, 900 | 985 |
| Shad | 1, 071, 300 | 59, 039 | 2, 492, 000 | 222, 480 | 13, 900 | 2, 978 | 14, 400 | 2, 385 | 3, 591, 600 | 286, 882 |
| Sharks | 11, 000 | 72 | 130, 200 | 1, 912 | | | | | 141, 200 | 1, 984 |
| Silversides | | | 1, 500 | 15 | | | | | 1, 500 | 15 |
| Skates | 31, 000 | 512 | 107, 800 | 607 | | | | | 138, 800 | 1, 119 |
| Smelt | 400 | 24 | | | | | | | 400 | 24 |
| Snapper, red | 3, 800 | 190 | 28, 200 | 1, 808 | | | | | 32, 000 | 1, 998 |
| Spanish mackerel | 200 | 6 | 9, 400 | 795 | | | | | 9, 600 | 801 |
| Spot | | | 183, 600 | 3, 427 | | | 2, 100 | 63 | 185, 700 | 3, 490 |
| Squeteagues or "sea trout," gray | 1, 056, 900 | 77, 080 | 6, 288, 700 | 156, 805 | | | 197, 600 | 6, 406 | 7, 543, 200 | 240, 291 |
| Squirrel hake | | | 161, 700 | 1, 627 | | | | | 161, 700 | 1, 627 |
| Striped bass | 138, 900 | 17, 185 | 147, 000 | 17, 425 | | | 24, 900 | 2, 490 | 310, 800 | 37, 100 |
| Sturgeon | 5, 000 | 1, 474 | 5, 100 | 652 | | | | | 10, 100 | 2, 126 |
| Suckers | 17, 900 | 517 | 50, 200 | 1, 905 | 23, 100 | 1, 127 | | | 91, 200 | 3, 549 |
| Sunfish | 1, 000 | 30 | | | | | | | 1, 000 | 30 |
| Swellfish | 57, 200 | 2, 000 | 1, 500 | 15 | | | | | 58, 700 | 2, 015 |
| Swordfish | 51, 500 | 9, 591 | | | | | | | 51, 500 | 9, 591 |
| Tautog | 11, 600 | 459 | 30, 600 | 697 | | | 1, 400 | 42 | 43, 600 | 1, 198 |
| Tilefish | 807, 600 | 24, 445 | 100 | 4 | | | | | 807, 700 | 24, 449 |
| Tomcod | 4, 700 | 198 | | | | | | | 4, 700 | 198 |
| Tuna | 148, 100 | 6, 676 | 107, 500 | 3, 276 | | | | | 255, 600 | 9, 952 |
| White perch | 33, 800 | 1, 173 | 19, 500 | 1, 955 | | | 17, 400 | 1, 780 | 70, 700 | 4, 908 |
| Whiting | 3, 955, 900 | 64, 255 | 6, 228, 500 | 50, 135 | | | | | 10, 184, 400 | 114, 390 |
| Wolffish | 6, 200 | 169 | | | | | | | 6, 200 | 169 |
| Yellow perch | 200 | 10 | 3, 200 | 306 | | | 7, 300 | 353 | 10, 700 | 669 |
| Total | 72, 737, 500 | 2, 206, 117 | 92, 052, 700 | 1, 513, 836 | 39, 800 | 4, 294 | 16, 984, 100 | 103, 239 | 181, 814, 100 | 3, 827, 486 |
| SHELLFISH, ETC. | | | | | | | | | | |
| Crabs: | | | | | | | | | | |
| Hard | 387, 300 | 23, 751 | 1, 113, 300 | 32, 426 | | | 183, 800 | 4, 585 | 1, 684, 400 | 60, 762 |
| King | | | 2, 460, 000 | 5, 707 | | | 81, 200 | 163 | 2, 541, 200 | 5, 870 |
| Soft and peelers | 34, 400 | 13, 932 | 319, 600 | 103, 767 | | | 85, 000 | 17, 000 | 439, 000 | 134, 699 |
| Lobsters | 244, 400 | 53, 297 | 326, 900 | 47, 578 | | | 3, 100 | 927 | 574, 400 | 101, 802 |
| Shrimp | 125, 000 | 21, 250 | | | | | | | 125, 000 | 21, 250 |
| Clams: | | | | | | | | | | |
| Hard, public [1] | 2, 008, 500 | 352, 407 | 2, 710, 700 | 348, 510 | | | 4, 400 | 559 | 4, 723, 600 | 701, 476 |
| Hard, private [1] | 234, 900 | 40, 938 | 214, 200 | 27, 536 | | | 20, 000 | 2, 775 | 469, 100 | 71, 249 |
| Soft, public [2] | 371, 800 | 33, 928 | 874, 700 | 54, 423 | | | | | 1, 246, 500 | 88, 351 |
| Surf or skimmer | 808, 800 | 51, 537 | 804, 900 | 20, 301 | | | | | 1, 613, 700 | 71, 838 |
| Conchs | 7, 000 | 695 | | | | | | | 7, 000 | 695 |
| Mussels, sea | 240, 800 | 18, 135 | | | | | 1, 900 | 323 | 242, 700 | 18, 458 |
| Oysters, market: [3] | | | | | | | | | | |
| Public, spring | 210, 000 | 49, 344 | 20, 900 | 2, 729 | | | | | 230, 900 | 52, 073 |
| Public, fall | 200, 300 | 47, 109 | 114, 300 | 11, 464 | | | | | 314, 600 | 58, 573 |
| Private, spring | 5, 153, 900 | 884, 391 | 2, 745, 900 | 342, 930 | | | | | 7, 899, 800 | 1, 227, 321 |
| Private, fall | 4, 642, 400 | 976, 385 | 2, 916, 700 | 367, 830 | | | 139, 700 | 14, 001 | 7, 698, 800 | 1, 358, 216 |

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[1] Statistics on hard clams are based on yields of 8 pounds of meats per standard bushel in New York, 9.49 pounds in New Jersey, and 9.52 pounds in Delaware.

[2] Statistics on soft clams are based on yields of 16 pounds of meat per standard bushel in New York and 19.04 pounds in New Jersey.

[3] Statistics on oysters are based on yields of 7.5 pounds of meats per standard bushel in New York, 5.76 pounds in New Jersey, and 6.67 pounds in Delaware.

### *Fisheries of the Middle Atlantic States, 1938*—Continued

CATCH: BY STATES—Continued

| Species | New York | | New Jersey | | Pennsylvania | | Delaware | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| SHELLFISH, ETC.—continued | | | | | | | | | | |
| Scallops: | | | | | | | | | | |
| Bay | 21,100 | 6,003 | | | | | | | 21,100 | 6,003 |
| Sea | 2,944,800 | 350,242 | 114,000 | 8,790 | | | | | 3,058,800 | 359,032 |
| Squid | 758,900 | 14,252 | 1,288,000 | 19,443 | | | | | 2,046,900 | 33,695 |
| Turtles: | | | | | | | | | | |
| Green | | | 3,900 | 39 | | | | | 3,900 | 39 |
| Loggerhead | | | 5,500 | 55 | | | | | 5,500 | 55 |
| Snapper | 35,500 | 2,480 | 8,700 | 897 | | | 3,600 | 284 | 47,800 | 3,661 |
| Bloodworms | 22,900 | 21,620 | | | | | | | 22,900 | 21,620 |
| Sandworms | 26,800 | 25,020 | | | | | | | 26,800 | 25,020 |
| Total | 18,479,500 | 2,986,716 | 16,042,200 | 1,394,425 | | | 522,700 | 40,617 | 35,044,400 | 4,421,758 |
| Grand total | 91,217,000 | 5,192,833 | 108,094,900 | 2,908,261 | 39,800 | 4,294 | 17,506,800 | 143,856 | 216,858,500 | 8,249,244 |

NOTES.—Data on the yield of shellfish meats per bushel are based on United States standard bushels of 2,150.4 cubic inches capacity. Prior to 1938 yields were based on bushels of the size prescribed by individual State regulations.

Statistics on the yield of fishery products for the Middle Atlantic States include the catch made by craft from this area in the southern trawl fishery as well as in other fisheries in the South Atlantic. The seed oyster fishery in the Middle Atlantic States was prosecuted in New York, New Jersey, and Delaware. In New York, 81 fishermen using 6 motor vessels, 19 motorboats, 32 other boats, 11 dredges, and 51 tongs, took 48,268 bushels of seed oysters, valued at $51,232, from public beds, and 23,941 bushels, valued at $27,346, from private beds. 47 of these fishermen are duplicated among those fishing for market oysters or other species. Similarly, the following craft and gear are duplicated: 1 motor vessel, 15 motorboats, 22 other boats, 2 dredges and 37 tongs. In New Jersey, 1,475 fishermen, using 2 motor vessels, 117 sail vessels, 83 motorboats, 18 other boats, 238 dredges, and 106 tongs, took 1,548,110 bushels of seed oysters, valued at $469,903 from public beds, and 1,500 bushels, valued at $600, from private beds. Of the total number of persons fishing for seed oysters in New Jersey, 1,462 are duplicated among those fishing for market oysters or other species. Similarly, the following craft and gear are duplicated: 2 motor vessels, 72 sail vessels, 81 motorboats, 17 other boats, 144 dredges, and 103 tongs. In Delaware, 41 fishermen using 5 motor vessels, 1 sail vessel, and 6 dredges, took 52,300 bushels of seed oysters, valued at $9,430, from public beds. Of the total number of persons fishing for seed oysters in Delaware, 18 are duplicated among those fishing for market oysters or other species. Similarly, the following craft and gear are duplicated: 2 motor vessels and 4 dredges.

## *Fisheries of the Middle Atlantic States, 1938*—Continued

### SUPPLEMENTARY TABLE SHOWING THE PRODUCTION OF CERTAIN SHELLFISH IN NUMBER AND BUSHELS

| Product | New York | | New Jersey | | Delaware | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Crabs: | | | | | | | | |
| Hard..........number.. | 1, 161, 900 | $23, 751 | 3, 339, 900 | $32, 426 | 551, 400 | $4, 585 | 5, 053, 200 | $60, 762 |
| King..............do.... | ---------- | ---------- | 615, 000 | 5, 707 | 20, 300 | 163 | 635, 300 | 5, 870 |
| Soft and peelers...do.... | 137, 600 | 13, 932 | 1, 278, 400 | 103, 767 | 340, 000 | 17, 000 | 1, 756, 000 | 134, 699 |
| Clams: | | | | | | | | |
| Hard, public...bushels.. | 251, 062 | 352, 407 | 285, 638 | 348, 510 | 462 | 559 | 537, 162 | 701, 476 |
| Hard, private......do.... | 29, 362 | 40, 938 | 22, 571 | 27, 536 | 2, 101 | 2, 775 | 54, 034 | 71, 249 |
| Soft, public........do.... | 23, 237 | 33, 928 | 45, 940 | 54, 423 | ---------- | ---------- | 69, 177 | 88, 351 |
| Surf or skimmer...do.... | 67, 400 | 51, 537 | 47, 825 | 20, 301 | ---------- | ---------- | 115, 225 | 71, 838 |
| Conchs..............do.... | 389 | 695 | ---------- | ---------- | ---------- | ---------- | 389 | 695 |
| Mussels, sea.........do.... | 24, 080 | 18, 135 | ---------- | ---------- | 166 | 323 | 24, 246 | 18, 458 |
| Oysters, market: | | | | | | | | |
| Public, spring......do.... | 28, 000 | 49, 344 | 3, 628 | 2, 729 | ---------- | ---------- | 31, 628 | 52, 073 |
| Public, fall.........do.... | 26, 707 | 47, 109 | 19, 844 | 11, 464 | ---------- | ---------- | 46, 551 | 58, 573 |
| Private, spring....do.... | 687, 187 | 884, 391 | 476, 719 | 342, 930 | ---------- | ---------- | 1, 163, 906 | 1, 227, 321 |
| Private, fall.......do.... | 618, 987 | 976, 385 | 506, 372 | 367, 830 | 20, 945 | 14, 001 | 1, 146, 304 | 1, 358, 216 |
| Scallops: | | | | | | | | |
| Bay..................do.... | 4, 220 | 6, 003 | ---------- | ---------- | ---------- | ---------- | 4, 220 | 6, 003 |
| Sea..................do.... | 490, 800 | 350, 242 | 26, 573 | 8, 790 | ---------- | ---------- | 517, 373 | 359, 032 |

NOTE.—Bushels represent U. S. Standard Bushels of 2,150.4 cubic inches capacity. Prior to 1938 data on bushels of shellfish were based on bushel measures of the size prescribed by individual State regulations. For more detailed information concerning shellfish measures the reader is referred to the section on conversion factors, p. 548 of this document.

## *Industries related to the fisheries of the Middle Atlantic States, 1938*

### OPERATING UNITS, SALARIES, AND WAGES

| Item | New York | New Jersey | Pennsylvania | Delaware | Total |
|---|---|---|---|---|---|
| Transporting: | | | | | |
| Persons engaged: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels.......................... | 110 | 24 | ---------- | ---------- | 134 |
| On boats.......................... | ---------- | 104 | ---------- | ---------- | 104 |
| Total.......................... | 110 | 128 | ---------- | ---------- | 238 |
| Vessels, motor.......................... | 24 | 10 | ---------- | ---------- | 34 |
| Net tonnage.......................... | 431 | 137 | ---------- | ---------- | 568 |
| Boats.......................... | ---------- | 82 | ---------- | ---------- | 82 |
| Wholesale and manufacturing: | | | | | |
| Establishments.......................... | 218 | 112 | 41 | 12 | 383 |
| Persons engaged: | | | | | |
| Proprietors.......................... | 44 | 89 | 37 | 9 | 179 |
| Salaried employees.......................... | 719 | 142 | 77 | 14 | 952 |
| Average for season.......................... | 2, 997 | 1, 436 | 330 | 302 | 5, 065 |
| Average for year.......................... | 2, 295 | 912 | 252 | 139 | 3, 598 |
| Paid to salaried employees.......................... | $2, 060, 806 | $319, 206 | $141, 064 | $18, 760 | $2, 539, 836 |
| Paid to wage earners.......................... | $3, 575, 952 | $865, 637 | $312, 667 | $119, 271 | $4, 873, 527 |
| Total salaries and wages.......................... | $5, 636, 758 | $1, 184, 843 | $453, 731 | $138, 031 | $7, 413, 363 |
| Fishermen manufacturing.......................... | 234 | 53 | ---------- | ---------- | 287 |

*Industries related to the fisheries of the Middle Atlantic States, 1938*—Continued

PRODUCTS MANUFACTURED

| Item | New York | | New Jersey | | Pennsylvania | | Delaware | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments: | | | | | | | | |
| Buffalofish, smoked pounds | 441,300 | $107,481 | ------ | ------ | ------ | ------ | ------ | ------ |
| Butterfish, smoked do | 476,200 | 119,280 | 73,000 | $22,500 | (1) | (1) | ------ | ------ |
| Carp, smoked do | 174,200 | 53,719 | (1) | (1) | ------ | ------ | ------ | ------ |
| Cisco, chubs, and tullibees, smoked pounds | 3,001,200 | 889,781 | (1) | (1) | (1) | (1) | ------ | ------ |
| Cod, fresh fillets do | 3,408,900 | 444,158 | 607,600 | 71,070 | ------ | ------ | ------ | ------ |
| Eels, smoked do | 7,000 | 1,576 | ------ | ------ | ------ | ------ | ------ | ------ |
| Flounders, fresh fillets pounds | 1,522,300 | 256,602 | 219,000 | 37,380 | ------ | ------ | ------ | ------ |
| Haddock, fresh fillets pounds | 2,194,100 | 275,782 | 1,790,400 | 221,260 | ------ | ------ | ------ | ------ |
| Hake, fresh fillets pounds | 105,500 | 10,550 | ------ | ------ | ------ | ------ | ------ | ------ |
| Herring, sea, smoked, bloaters pounds | 92,300 | 22,098 | (1) | (1) | 356,200 | $40,769 | ------ | ------ |
| Lake trout, smoked pounds | 136,400 | 45,336 | (1) | (1) | (1) | (1) | ------ | ------ |
| Mackerel, smoked pounds | 543,500 | 97,312 | (1) | (1) | (1) | (1) | ------ | ------ |
| Pollock, fresh fillets pounds | 45,500 | 5,130 | ------ | ------ | ------ | ------ | ------ | ------ |
| Paddlefish or spoonbill cat, smoked pounds | 255,200 | 163,233 | ------ | ------ | ------ | ------ | ------ | ------ |
| Salmon: | | | | | | | | |
| Smoked do | 5,522,600 | 1,628,184 | 391,225 | 138,594 | (1) | (1) | ------ | ------ |
| Kippered do | 159,500 | 47,906 | (1) | (1) | (1) | (1) | ------ | ------ |
| Caviar, canned standard cases | 1,563 | 28,077 | ------ | ------ | ------ | ------ | ------ | ------ |
| Shad, smoked pounds | 83,700 | 16,952 | ------ | ------ | (1) | (1) | ------ | ------ |
| Sturgeon: | | | | | | | | |
| Smoked do | 374,300 | 319,749 | (1) | (1) | (1) | (1) | ------ | ------ |
| Caviar, canned standard cases | 2,491 | 307,298 | ------ | ------ | ------ | ------ | ------ | ------ |
| Whitefish: | | | | | | | | |
| Smoked pounds | 946,000 | 230,259 | 140,250 | 47,755 | (1) | (1) | ------ | ------ |
| Caviar, canned standard cases | 325 | 6,660 | ------ | ------ | ------ | ------ | ------ | ------ |
| Clams: | | | | | | | | |
| Hard: | | | | | | | | |
| Fresh-shucked gallons | ------ | ------ | ------ | ------ | 5,635 | 11,781 | ------ | ------ |
| Chowder, canned standard cases | (1) | (1) | 179,133 | 648,776 | ------ | ------ | ------ | ------ |
| Soft, fresh-shucked gallons | ------ | ------ | 12,470 | 12,470 | ------ | ------ | ------ | ------ |
| Marine-shell products: | | | | | | | | |
| Buttons gross | 1,254,224 | 688,604 | 1,495,932 | 1,153,457 | (1) | (1) | ------ | ------ |
| Novelties | ------ | 76,200 | ------ | 78,604 | ------ | ------ | ------ | ------ |
| Oysters, fresh-shucked gallons | 332,277 | 674,337 | 402,886 | 722,915 | 67,700 | 127,730 | (1) | (1) |
| Oyster-shell products: | | | | | | | | |
| Poultry feed tons | (1) | (1) | 4,514 | 35,228 | (1) | (1) | (1) | (1) |
| Lime do | (1) | (1) | 1,480 | 6,567 | (1) | (1) | (1) | (1) |
| Whale oil gallons | 7,254,300 | 3,025,831 | ------ | ------ | ------ | ------ | ------ | ------ |
| Unclassified products: | | | | | | | | |
| Smoked pounds | ------ | ------ | [2] 692,900 | [2] 308,576 | [3] 1,596,600 | [3] 488,324 | ------ | ------ |
| Canned standard cases | [4] 18,375 | [4] 222,232 | (5) | (5) | ------ | ------ | (5) | (5) |
| Byproducts | (5) | (5) | ------ | [6] 416,223 | (5) | (5) | (5) | (5) |
| Miscellaneous | ------ | [7] 379,013 | ------ | [8] 195,648 | [9] 319,511 | [9] 100,805 | ------ | [10] $406,162 |
| Total | ------ | 10,143,340 | ------ | 4,117,023 | ------ | 769,409 | ------ | 406,162 |

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[1] The production of this item is included under "Unclassified products."

[2] Includes smoked bluefish, carp, cisco, chub, cod, finnan haddie, haddock fillets, sea herring bloaters, lake trout, mackerel, scup, sturgeon, tullibees; and kippered salmon.

[3] Includes smoked butterfish, chub, cisco, haddock fillets, lake trout, mackerel, salmon, shad, sturgeon, tullibees, and whitefish; and kippered herring and salmon.

[4] Includes canned pickled eels, pickled sea mussels, fish paste, clam products, and turtle and terrapin products.

[5] This item has been included under "Miscellaneous."

[6] Includes tuna and mixed liver oils, miscellaneous fish oil, king crab scrap, and menhaden products.

[7] Includes fresh fillets of mackerel and halibut; halibut liver oil; menhaden products; crushed oyster-shell products; fresh-water mussel-shell buttons; and miscellaneous fish meal.

[8] Includes salted boneless cod; and canned oysters, hard and soft clam products, shore dinners, fish chowder, and shellfish newberg.

[9] Includes pickled sea herring, king crab and miscellaneous dry scrap, marine-shell buttons, and crushed oyster-shell products.

[10] Includes fresh-shucked oysters; canned alewives and alewife roe; crushed oyster-shell products; king crab scrap; and menhaden products.

*Industries related to the fisheries of the Middle Atlantic States, 1938*—Continued

PRODUCTS MANUFACTURED—Continued

| Item | New York | | New Jersey | | Pennsylvania | | Delaware | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quan-tity* | *Value* |
| By fishermen: | | | | | | | | |
| Butterfish, smoked pounds | 400 | $80 | | | | | | |
| Eels, smoked do | 33,900 | 7,940 | 8,000 | $2,500 | | | | |
| Herring roe, salted pounds | | | 2,100 | 357 | | | | |
| Whiting, smoked pounds | 1,200 | 240 | | | | | | |
| Scallops: | | | | | | | | |
| Bay, fresh-shucked gallons | 2,361 | 5,903 | | | | | | |
| Sea, fresh-shucked gallons | 303,509 | 317,751 | 12,661 | 10,634 | | | | |
| King crab meal tons | | | 85 | 2,565 | | | | |
| Total | | 331,914 | | 16,056 | | | | |
| Grand total | | 10,475,254 | | 4,133,079 | | $769,409 | | $406,162 |

NOTE.—The total value of the manufactured products for the Middle Atlantic States was as follows: By manufacturing establishments, $15,435,934, and by fishermen, $347,970. Some of the above products may have been manufactured from fishery products imported from another State or a foreign country, therefore they cannot be correlated directly with the catch within the State. Of the total number of persons engaged on transporting craft, 212 have been included as fishermen, and among the total number of persons engaged in the preparation of fishermen's prepared products, all have been included as fishermen. The whale products shown above were manufactured on floating factory ships operating in the Southern Hemisphere.

## NEW YORK

### *Fisheries of New York, 1938*

OPERATING UNITS: BY GEAR

| Item | Purse seines | | Haul seines, common | Gill nets | | | Lines | |
|---|---|---|---|---|---|---|---|---|
| | Mackerel | Menhaden | | Drift | Runaround | Stake | Hand | Trawl |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 74 | 205 | | 21 | 17 | | 74 | 110 |
| On boats and shore: | | | | | | | | |
| Regular | | | 47 | 44 | | 86 | 48 | 64 |
| Casual | | | 118 | 417 | | 170 | 6 | |
| Total | 74 | 205 | 165 | 482 | 17 | 256 | 128 | 174 |
| Vessels: | | | | | | | | |
| Steam | | 1 | | | | | | |
| Net tonnage | | 45 | | | | | | |
| Motor | 4 | 7 | | 3 | 4 | | 15 | 13 |
| Net tonnage | 195 | 549 | | 40 | 49 | | 227 | 318 |
| Total vessels | 4 | 8 | | 3 | 4 | | 15 | 13 |
| Total net tonnage | 195 | 594 | | 40 | 49 | | 227 | 318 |
| Boats: | | | | | | | | |
| Motor | | | 11 | | | 45 | 22 | 49 |
| Other | | | 52 | 228 | | 97 | 6 | |
| Accessory boats | 7 | 17 | | 1 | 2 | | | 16 |
| Apparatus: | | | | | | | | |
| Number | 4 | 8 | 60 | 473 | 4 | 709 | 128 | 2,148 |
| Length, yards | 1,390 | 3,130 | 11,852 | | | | | |
| Square yards | | | | 808,651 | 13,640 | 95,796 | | |
| Hooks, baits, or snoods | | | | | | | 132 | 153,750 |

## *Fisheries of New York, 1938*—Continued

### OPERATING UNITS: BY GEAR—Continued

| Item | Lines—Con. | | Pound nets | Fyke nets | Dip nets | Drag nets | Otter trawls, fish | Pots, eel |
|---|---|---|---|---|---|---|---|---|
| | Trot with baits or snoods | Trot with hooks | | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | 2 | | | 426 | 2 |
| On boats and shore: | | | | | | | | |
| Regular | 68 | 1 | 94 | 23 | 20 | 30 | 106 | 37 |
| Casual | 50 | 34 | | 124 | 80 | 10 | | 89 |
| Total | 118 | 35 | 94 | 149 | 100 | 40 | 532 | 128 |
| Vessels, motor | | | | 1 | | | 99 | 1 |
| Net tonnage | | | | 12 | | | 1,954 | 12 |
| Boats: | | | | | | | | |
| Motor | 50 | | 1 | 2 | | 20 | 53 | 9 |
| Other | 61 | 18 | 10 | 82 | 91 | | | 62 |
| Apparatus: | | | | | | | | |
| Number | 59 | 19 | 125 | 396 | 91 | 20 | 152 | 2,014 |
| Yards at mouth | | | | | | 40 | 3,617 | |
| Hooks, baits, or snoods | 31,400 | 3,750 | | | | | | |

| Item | Pots—Con. | | Harpoons | Spears | Dredges | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Fish | Lobster | | | Clam | Crab | Mussel | Oyster | | Scallop |
| | | | | | | | | Common | Suction | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | 6 | 49 | | 14 | | 2 | 135 | 4 | 149 |
| On boats and shore: | | | | | | | | | | |
| Regular | 24 | 99 | 10 | 22 | 20 | 2 | 6 | 14 | | |
| Casual | 19 | 21 | | 48 | | | | | | |
| Total | 43 | 126 | 59 | 70 | 34 | 2 | 8 | 149 | 4 | 149 |
| Vessels, motor | | 3 | 12 | | 6 | | 1 | 34 | 1 | 26 |
| Net tonnage | | 21 | 288 | | 64 | | 13 | 594 | 20 | 596 |
| Boats: | | | | | | | | | | |
| Motor | 20 | 56 | 5 | 10 | 10 | 1 | 3 | 7 | | |
| Other | | 5 | | 35 | | | | | | |
| Accessory boats | | | 12 | | | | | | | |
| Apparatus: | | | | | | | | | | |
| Number | 1,210 | 10,150 | 17 | 70 | 32 | 2 | 8 | 76 | 1 | 52 |
| Yards at mouth | | | | | 52 | 4 | 14 | 111 | 2 | 187 |

## *Fisheries of New York, 1938*—Continued

### OPERATING UNITS: BY GEAR—Continued

| Item | Tongs |  | Rakes, other than for oysters | Forks | By hand, other than for oysters | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
|  | Oyster | Other |  |  |  |  |
|  | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: |  |  |  |  |  |  |
| On vessels | 7 | 54 | 1 |  |  | 1,032 |
| On boats and shore: |  |  |  |  |  |  |
| Regular | 147 | 707 | 122 | 121 |  | 970 |
| Casual | 27 | 537 | 202 | 248 | 12 | 1,367 |
| Total | 181 | 1,298 | 325 | 369 | 12 | 3,369 |
| Vessels: |  |  |  |  |  |  |
| Steam |  |  |  |  |  | 1 |
| Net tonnage |  |  |  |  |  | 45 |
| Motor | 5 | 34 | 1 |  |  | 205 |
| Net tonnage | 43 | 225 | 7 |  |  | 3,952 |
| Sail |  | 1 |  |  |  | 1 |
| Net tonnage |  | 6 |  |  |  | 6 |
| Total vessels | 5 | 35 | 1 |  |  | 207 |
| Total net tonnage | 43 | 231 | 7 |  |  | 4,003 |
| Boats: |  |  |  |  |  |  |
| Motor | 147 | 707 | 54 |  |  | 717 |
| Other | 83 | 612 | 270 |  | 12 | 1,042 |
| Accessory boats |  |  |  |  |  | 50 |
| Apparatus, number | 180 | 1,298 | 325 | 369 |  |  |

### CATCH: BY GEAR

| Species | Purse seines |  |  |  | Haul seines |  | Gill nets, drift |  |
|---|---|---|---|---|---|---|---|---|
|  | Mackerel |  | Menhaden |  |  |  |  |  |
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives |  |  |  |  | 9,200 | $82 | 8,200 | $83 |
| Bluefish |  |  |  |  | 1,900 | 287 | 5,000 | 600 |
| Butterfish |  |  |  |  | 200 | 6 |  |  |
| Carp |  |  |  |  | 145,800 | 6,825 | 3,000 | 180 |
| Catfish and bullheads |  |  |  |  | 9,200 | 1,415 |  |  |
| Eels, common |  |  |  |  | 100 | 6 |  |  |
| Flounders: |  |  |  |  |  |  |  |  |
| Blackback |  |  |  |  | 7,300 | 362 |  |  |
| Fluke |  |  |  |  | 100 | 7 |  |  |
| Kingfish or "king mackerel" |  |  |  |  | 18,100 | 906 |  |  |
| Mackerel | 385,600 | $12,944 |  |  |  |  | 105,300 | 4,620 |
| Menhaden |  |  | 22,100,000 | $99,934 |  |  |  |  |
| Scup |  |  |  |  | 39,400 | 1,184 |  |  |
| Shad |  |  |  |  | 11,600 | 620 | 946,000 | 52,554 |
| Squeteagues or "sea trout," gray |  |  |  |  | 300,700 | 21,049 |  |  |
| Striped bass |  |  |  |  | 71,100 | 8,583 | 15,300 | 1,838 |
| Sturgeon |  |  |  |  | 100 | 15 | 2,800 | 1,030 |
| Suckers |  |  |  |  | 2,900 | 87 |  |  |
| White perch |  |  |  |  | 2,600 | 79 | 1,600 | 50 |
| Shrimp |  |  |  |  | 25,000 | 4,250 |  |  |
| Total | 385,600 | 12,944 | 22,100,000 | 99,934 | 645,300 | 45,763 | 1,087,200 | 60,955 |

## *Fisheries of New York, 1938*—Continued

### CATCH: BY GEAR—Continued

| Species | Gill nets—Continued | | | | Lines | | | |
|---|---|---|---|---|---|---|---|---|
| | Runaround | | Stake | | Hand | | Trawl | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 3,700 | $37 | | | | |
| Bluefish | 5,000 | $580 | 17,100 | 2,046 | 77,100 | $8,822 | | |
| Bonito | | | | | 400 | 8 | | |
| Butterfish | | | 3,900 | 150 | | | 100 | $3 |
| Carp | | | 45,000 | 2,696 | | | | |
| Catfish and bullheads | | | 200 | 30 | | | | |
| Cod | | | | | 182,000 | 5,963 | 1,759,500 | 79,189 |
| Cusk | | | | | | | 100 | 2 |
| Eels: | | | | | | | | |
| Common | | | | | 1,200 | 72 | | |
| Conger | | | | | | | 2,900 | 58 |
| Groupers | | | | | 4,500 | 225 | | |
| Haddock | | | | | | | 29,800 | 1,235 |
| Hake | | | | | | | 78,500 | 1,734 |
| Halibut | | | | | | | 700 | 84 |
| Kingfish or "king mackerel" | | | 1,000 | 25 | | | | |
| King whiting or "kingfish" | | | 2,000 | 40 | | | | |
| Mackerel | 206,100 | 6,595 | 48,300 | 1,167 | 34,600 | 888 | | |
| Pollock | | | | | 53,000 | 1,060 | 47,400 | 743 |
| Scup | | | 500 | 15 | 8,200 | 235 | 1,200 | 36 |
| Sea bass | | | 300 | 24 | 48,000 | 3,691 | | |
| Shad | | | 14,900 | 815 | | | | |
| Sharks | | | | | 100 | 2 | | |
| Skates | | | | | | | 1,300 | 17 |
| Snapper, red | | | | | 3,800 | 190 | | |
| Squeteagues or "sea trout," gray | 13,900 | 1,022 | 118,000 | 9,443 | 1,800 | 144 | 27,700 | 2,207 |
| Striped bass | | | 17,500 | 2,118 | 1,800 | 216 | | |
| Sturgeon | | | 800 | 205 | | | | |
| Suckers | | | 400 | 13 | | | | |
| Swordfish | | | | | | | 200 | 19 |
| Tilefish | | | | | | | 805,100 | 24,339 |
| Tuna | | | | | 500 | 10 | | |
| White perch | | | 20,600 | 702 | | | | |
| Whiting | | | | | | | 400 | 6 |
| Total | 225,000 | 8,197 | 294,200 | 19,526 | 417,000 | 21,526 | 2,754,900 | 109,672 |

| Species | Lines—Continued | | | | Pound nets | | Fyke nets | |
|---|---|---|---|---|---|---|---|---|
| | Trot with baits or snoods | | Trot with hooks | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | | | 24,600 | $246 |
| Bluefish | | | | | 143,400 | $16,598 | | |
| Bonito | | | | | 110,800 | 5,539 | | |
| Butterfish | | | | | 2,719,500 | 106,296 | | |
| Carp | | | 400 | $24 | | | 11,100 | 662 |
| Catfish and bullheads | | | 1,500 | 267 | | | 25,200 | 3,636 |
| Cod | | | | | 100 | 6 | | |
| Eels, common | | | 1,800 | 107 | 14,300 | 858 | 21,700 | 1,305 |
| Flounders: | | | | | | | | |
| Blackback | | | | | 32,200 | 1,369 | 91,000 | 4,670 |
| Fluke | | | | | 62,300 | 8,204 | | |
| Frigate mackerel | | | | | 11.500 | 232 | | |
| Herring, sea | | | | | 5,900 | 106 | | |
| Hickory shad | | | | | 2,300 | 40 | | |
| Kingfish or "king mackerel" | | | | | 21,000 | 1,260 | | |
| Mackerel | | | | | 979,700 | 38,399 | | |
| Menhaden | | | | | 532,600 | 2,663 | | |
| Pollock | | | | | 21,400 | 435 | | |
| Scup | | | | | 478,500 | 15,305 | | |
| Sea bass | | | | | 44,000 | 2,382 | | |
| Sea robin | | | | | 9,200 | 182 | | |
| Shad | | | | | 98,800 | 5.050 | | |
| Sharks | | | | | 7,900 | 39 | | |
| Skates | | | | | 2,100 | 23 | | |
| Smelt | | | | | | | 400 | 24 |
| Spanish mackerel | | | | | 200 | 6 | | |
| Squeteagues or "sea trout," gray | | | | | 545,100 | 39,356 | | |
| Striped bass | | | | | 32,300 | 4,325 | 100 | 14 |

## *Fisheries of New York, 1938*—Continued

### CATCH: BY GEAR—Continued

| Species | Lines—Continued | | | | Pound nets | | Fyke nets | |
|---|---|---|---|---|---|---|---|---|
| | Trot with baits or snoods | | Trot with hooks | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Sturgeon | | | | | 300 | $38 | | |
| Suckers | | | | | | | 14,600 | $417 |
| Sunfish | | | | | | | 1,000 | 30 |
| Swellfish | | | | | 57,200 | 2,000 | | |
| Tautog | | | | | 11,400 | 454 | | |
| Tomcod | | | 400 | $20 | | | 4,300 | 178 |
| Tuna | | | | | 147,600 | 6,666 | | |
| White perch | | | | | | | 9,000 | 342 |
| Whiting | | | | | 124,200 | 2,452 | | |
| Yellow perch | | | | | | | 200 | 10 |
| Crabs, hard | 369,900 | $22,863 | | | | | | |
| Squid | | | | | 80,500 | 1,610 | | |
| Turtles, snapper | 35,500 | 2,480 | | | | | | |
| Total | 405,400 | 25,343 | 4,100 | 418 | 6,296,300 | 261,893 | 203,200 | 11,534 |

| Species | Dip nets | | Drag nets | | Otter trawls | | Pots | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Eel | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | 20,700 | $207 | | |
| Anchovies | | | | | 9,600 | 288 | | |
| Bluefish | | | | | 100 | 5 | | |
| Bonito | | | | | 100 | 4 | | |
| Butterfish | | | | | 1,771,500 | 64,057 | | |
| Cod | | | | | 6,597,000 | 308,243 | | |
| Croaker | | | | | 400 | 12 | | |
| Cunner | | | | | 2,300 | 46 | | |
| Eels: | | | | | | | | |
| Common | | | | | | | 158,500 | $9,660 |
| Conger | | | | | 8,500 | 158 | | |
| Flounders: | | | | | | | | |
| Gray sole | | | | | 51,800 | 3,365 | | |
| Lemon sole | | | | | 613,300 | 47,980 | | |
| Yellowtail and dab | | | | | 3,010,600 | 66,695 | | |
| Blackback | | | | | 6,018,600 | 288,246 | | |
| Fluke | | | | | 2,389,700 | 200,598 | | |
| Unclassified | | | | | 33,500 | 1,665 | | |
| Grayfish | | | | | 300 | 5 | | |
| Haddock | | | | | 11,077,600 | 413,019 | | |
| Hake | | | | | 245,300 | 6,265 | | |
| Halibut | | | | | 47,100 | 5,893 | | |
| Herring, sea | | | | | 8,500 | 181 | | |
| King whiting or "kingfish" | | | | | 300 | 15 | | |
| Mackerel | | | | | 26,600 | 750 | | |
| Pollock | | | | | 183,900 | 3,508 | | |
| Scup | | | | | 1,964,100 | 45,039 | | |
| Sea bass | | | | | 112,700 | 8,496 | | |
| Sea robin | | | | | 2,500 | 49 | | |
| Sharks | | | | | 3,000 | 31 | | |
| Skates | | | | | 27,600 | 472 | | |
| Squeteagues or "sea trout," gray | | | | | 49,700 | 3,859 | | |
| Striped bass | | | | | 800 | 91 | | |
| Sturgeon | | | | | 1,000 | 186 | | |
| Tautog | | | | | 200 | 5 | | |
| Tilefish | | | | | 2,500 | 106 | | |
| Whiting | | | | | 3,831,300 | 61,797 | | |
| Wolffish | | | | | 6,200 | 169 | | |
| Crabs: | | | | | | | | |
| Hard | 11,200 | $618 | | | | | | |
| Soft and peelers | 34,400 | 13,932 | | | | | | |
| Lobsters | | | | | 17,300 | 3,305 | | |
| Shrimp | | | 100,000 | $17,000 | | | | |
| Conchs | | | | | 7,000 | 695 | | |
| Scallops, sea | | | | | 2,300 | 262 | | |
| Squid | | | | | 678,400 | 12,642 | | |
| Total | 45,600 | 14,550 | 100,000 | 17,000 | 38,823,900 | 1,548,409 | 158,500 | 9,660 |

## *Fisheries of New York, 1938*—Continued

### CATCH: BY GEAR—Continued

| Species | Pots—Continued | | | | Harpoons | |
|---|---|---|---|---|---|---|
| | Fish | | Lobster | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Sea bass | 79, 700 | $7, 570 | | | | |
| Swordfish | | | | | 51, 300 | $9, 572 |
| Lobsters | | | 227, 100 | $49, 992 | | |
| Total | 79, 700 | 7, 570 | 227, 100 | 49, 992 | 51, 300 | 9, 572 |

| Species | Spears | | Dredges | | Tongs | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels, common | 21, 800 | $1, 308 | | | | |
| Crabs, hard | | | 6, 200 | $270 | | |
| Clams: | | | | | | |
| Hard, public | | | | | 2, 008, 500 | $352, 407 |
| Hard, private | | | | | 234, 900 | 40, 938 |
| Soft, public | | | | | 3, 000 | 285 |
| Surf or skimmer | | | 808, 800 | 51, 537 | | |
| Mussels, sea | | | 113, 300 | 8, 566 | 114, 300 | 8, 581 |
| Oysters, market: | | | | | | |
| Public, spring | | | 3, 800 | 875 | 206, 200 | 48, 469 |
| Public, fall | | | 3, 800 | 875 | 196, 500 | 46, 234 |
| Private, spring | | | 5, 153, 900 | 884, 391 | | |
| Private, fall | | | 4, 642, 400 | 976, 385 | | |
| Scallops: | | | | | | |
| Bay | | | | | 21, 100 | 6, 003 |
| Sea | | | 2, 942, 500 | 349, 980 | | |
| Total | 21, 800 | 1, 308 | 13, 674, 700 | 2, 272, 879 | 2, 784, 500 | 502, 917 |

| Species | Rakes | | Forks | | By hand | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams, soft, public | 368, 300 | $33, 604 | | | 500 | $39 |
| Mussels, sea | | | | | 13, 200 | 988 |
| Bloodworms | | | 22, 900 | $21, 620 | | |
| Sandworms | | | 26, 800 | 25, 020 | | |
| Total | 368, 300 | 33, 604 | 49, 700 | 46, 640 | 13, 700 | 1, 027 |

### OPERATING UNITS: BY COUNTIES

| Item | Albany | Columbia | Dutchess | Greene | Kings | Nassau | New York |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | | 63 | 41 | 492 |
| On boats and shore: | | | | | | | |
| Regular | | | 5 | 2 | 74 | 135 | |
| Casual | 16 | 40 | 117 | 27 | 30 | 233 | |
| Total | 16 | 40 | 122 | 29 | 167 | 409 | 492 |
| Vessels, motor | | | | | 30 | 12 | 72 |
| Net tonnage | | | | | 312 | 206 | 1, 933 |
| Boats: | | | | | | | |
| Motor | | | | | 37 | 49 | |
| Other | 8 | 18 | 60 | 17 | 7 | 261 | |
| Accessory boats | | | | | | | 29 |
| Apparatus: | | | | | | | |
| Purse seines, mackerel | | | | | | | |
| Length, yards | | | | | | | 1, 39 |
| Haul seines, common | | 4 | 6 | 4 | | | |
| Length, yards | | 280 | 360 | 1, 225 | | | |
| Gill nets: | | | | | | | |
| Drift | 1 | 7 | 38 | 3 | | | 240 |
| Square yards | 1, 800 | 11, 200 | 117, 926 | 10, 000 | | | 80, 400 |
| Runaround | | | | | | 1 | 1 |
| Square yards | | | | | | 3, 800 | 8, 000 |
| Stake | | | 38 | 9 | | 17 | |
| Square yards | | | 2, 872 | 530 | | 8, 850 | |

## *Fisheries of New York, 1938*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Albany | Columbia | Dutchess | Greene | Kings | Nassau | New York |
|---|---|---|---|---|---|---|---|
| Apparatus—Continued. | | | | | | | |
| Lines: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Hand | -------- | -------- | -------- | -------- | 16 | -------- | 57 |
| Hooks and baits | -------- | -------- | -------- | -------- | 16 | -------- | 57 |
| Trawl | -------- | -------- | -------- | -------- | 20 | 90 | 1,800 |
| Hooks | -------- | -------- | -------- | -------- | 4,000 | 4,800 | 97,950 |
| Trot with baits or snoods | -------- | -------- | -------- | -------- | -------- | 7 | -------- |
| Baits or snoods | -------- | -------- | -------- | -------- | -------- | 1,400 | -------- |
| Trot with hooks | -------- | -------- | 11 | 1 | -------- | -------- | -------- |
| Hooks | -------- | -------- | 1,975 | 125 | -------- | -------- | -------- |
| Pound nets | -------- | -------- | -------- | -------- | -------- | 5 | -------- |
| Fyke nets | 19 | 58 | 82 | 16 | -------- | -------- | -------- |
| Dip nets | -------- | -------- | -------- | -------- | -------- | 61 | -------- |
| Otter trawls, fish | -------- | -------- | -------- | -------- | 41 | 10 | 53 |
| Yards at mouth | -------- | -------- | -------- | -------- | 942 | 169 | 1,613 |
| Pots: | | | | | | | |
| Eel | -------- | 4 | -------- | -------- | 195 | -------- | -------- |
| Fish | -------- | -------- | -------- | -------- | -------- | 1,210 | -------- |
| Lobster | -------- | -------- | -------- | -------- | 2,418 | 72 | -------- |
| Harpoons | -------- | -------- | -------- | -------- | -------- | -------- | 10 |
| Spears | -------- | -------- | -------- | -------- | 4 | 16 | -------- |
| Dredges: | | | | | | | |
| Clam | -------- | -------- | -------- | -------- | 22 | 10 | -------- |
| Yards at mouth | -------- | -------- | -------- | -------- | 34 | 18 | -------- |
| Crab | -------- | -------- | -------- | -------- | 2 | -------- | -------- |
| Yards at mouth | -------- | -------- | -------- | -------- | 4 | -------- | -------- |
| Mussel | -------- | -------- | -------- | -------- | -------- | 6 | 2 |
| Yards at mouth | -------- | -------- | -------- | -------- | -------- | 12 | 2 |
| Oyster: | | | | | | | |
| Common | -------- | -------- | -------- | -------- | -------- | 18 | -------- |
| Yards at mouth | -------- | -------- | -------- | -------- | -------- | 26 | -------- |
| Suction | -------- | -------- | -------- | -------- | -------- | 1 | -------- |
| Yards at mouth | -------- | -------- | -------- | -------- | -------- | 2 | -------- |
| Scallop | -------- | -------- | -------- | -------- | -------- | -------- | 52 |
| Yards at mouth | -------- | -------- | -------- | -------- | -------- | -------- | 187 |
| Tongs: | | | | | | | |
| Oyster | -------- | -------- | -------- | -------- | -------- | 33 | -------- |
| Other | -------- | -------- | -------- | -------- | -------- | 256 | -------- |
| Rakes, other than for oysters | -------- | -------- | -------- | -------- | -------- | 124 | -------- |
| Forks | -------- | -------- | -------- | -------- | 19 | 22 | -------- |

| Item | Orange | Putnam | Rensselaer | Rockland | Suffolk | Ulster | Westchester |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | -------- | -------- | -------- | -------- | 436 | -------- | -------- |
| On boats and shore: | | | | | | | |
| Regular | -------- | 2 | -------- | 7 | 710 | 10 | 25 |
| Casual | 35 | 12 | 8 | 165 | 375 | 155 | 154 |
| Total | 35 | 14 | 8 | 172 | 1,521 | 165 | 179 |
| Vessels: | | | | | | | |
| Steam | -------- | -------- | -------- | -------- | 1 | -------- | -------- |
| Net tonnage | -------- | -------- | -------- | -------- | 45 | -------- | -------- |
| Motor | -------- | -------- | -------- | -------- | 91 | -------- | -------- |
| Net tonnage | -------- | -------- | -------- | -------- | 1,501 | -------- | -------- |
| Sail | -------- | -------- | -------- | -------- | 1 | -------- | -------- |
| Net tonnage | -------- | -------- | -------- | -------- | 6 | -------- | -------- |
| Total vessels | -------- | -------- | -------- | -------- | 93 | -------- | -------- |
| Total net tonnage | -------- | -------- | -------- | -------- | 1,552 | -------- | -------- |
| Boats: | | | | | | | |
| Motor | -------- | -------- | -------- | -------- | 631 | -------- | -------- |
| Other | 17 | 6 | 3 | 88 | 384 | 86 | 87 |
| Accessory boats | -------- | -------- | -------- | -------- | 21 | -------- | -------- |
| Apparatus: | | | | | | | |
| Purse seines, menhaden | -------- | -------- | -------- | -------- | 8 | -------- | -------- |
| Length, yards | -------- | -------- | -------- | -------- | 3,130 | -------- | -------- |
| Haul seines, common | 2 | 2 | 2 | 4 | 26 | 2 | 8 |
| Length, yards | 200 | 220 | 300 | 570 | 7,200 | 466 | 1,031 |
| Gill nets: | | | | | | | |
| Drift | 9 | 4 | -------- | 48 | 1 | 69 | 53 |
| Square yards | 27,500 | 13,300 | -------- | 153,235 | 500 | 210,040 | 182,750 |
| Runaround | -------- | -------- | -------- | -------- | 2 | -------- | -------- |
| Square yards | -------- | -------- | -------- | -------- | 1,840 | -------- | -------- |
| Stake | 1 | 9 | -------- | 227 | 280 | 12 | 116 |
| Square yards | 166 | 100 | -------- | 4,330 | 72,000 | 5,081 | 1,867 |

*Fisheries of New York, 1938*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Orange | Putnam | Rensselaer | Rockland | Suffolk | Ulster | Westchester |
|---|---|---|---|---|---|---|---|
| Apparatus—Continued | | | | | | | |
| Lines: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Hand | | | | | 55 | | |
| Hooks and baits | | | | | 59 | | |
| Trawl | | | | | 238 | | |
| Hooks | | | | | 47,000 | | |
| Trot with baits or snoods | | | | | 52 | | |
| Baits or snoods | | | | | 30,000 | | |
| Trot with hooks | 5 | | | 2 | | | |
| Hooks | 1,150 | | | 500 | | | |
| Pound nets | | | | | 120 | | |
| Fyke nets | 7 | 9 | 3 | 3 | 90 | 84 | 25 |
| Dip nets | | | | | 30 | | |
| Drag nets | | | | | 20 | | |
| Yards at mouth | | | | | 40 | | |
| Otter trawls, fish | | | | | 48 | | |
| Yards at mouth | | | | | 893 | | |
| Pots: | | | | | | | |
| Eel | 15 | 60 | | 676 | 520 | 33 | 511 |
| Lobster | | | | | 7,660 | | |
| Harpoons | | | | | 7 | | |
| Spears | | | | | 50 | | |
| Dredges, oyster, common | | | | | 58 | | |
| Yards at mouth | | | | | 85 | | |
| Tongs: | | | | | | | |
| Oyster | | | | | 147 | | |
| Other | | | | | 1,042 | | |
| Rakes, other than for oysters | | | | | 201 | | |
| Forks | | | | | 328 | | |

CATCH: BY COUNTIES

| Species | Albany | | Columbia | | Dutchess | | Greene | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 2,600 | $26 | 6,800 | $68 | 12,100 | $121 | 1,700 | $17 |
| Carp | 1,000 | 60 | 7,300 | 438 | 21,600 | 1,313 | 35,600 | 2,136 |
| Catfish and bullheads | 2,000 | 240 | 3,600 | 444 | 8,500 | 1,563 | 5,700 | 1,018 |
| Eels, common | | | 400 | 24 | 1,200 | 72 | 400 | 24 |
| Shad | 2,800 | 112 | 55,400 | 2,770 | 140,000 | 7,057 | 17,600 | 880 |
| Striped bass | | | | | 900 | 110 | 200 | 28 |
| Sturgeon | | | | | 1,900 | 760 | | |
| Suckers | 2,100 | 42 | 4,000 | 120 | 3,000 | 97 | 900 | 28 |
| Sunfish | | | | | 700 | 23 | | |
| Tomcod | | | | | 400 | 20 | | |
| White perch | 500 | 23 | 900 | 36 | 2,100 | 77 | 600 | 23 |
| Total | 11,000 | 503 | 78,400 | 3,900 | 192,400 | 11,213 | 62,700 | 4,154 |

| Species | Kings | | Nassau | | New York | | Orange | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | | | 2,400 | $24 |
| Bluefish | 10,300 | $1,236 | 34,300 | $4,110 | 64,300 | $7,281 | | |
| Bonito | | | 10,400 | 312 | 500 | 12 | | |
| Butterfish | | | 130,300 | 4,957 | 1,614,100 | 58,635 | | |
| Carp | | | | | | | 9,000 | 540 |
| Catfish and bullheads | | | | | | | 1,000 | 160 |
| Cod | 221,000 | 6,731 | 211,000 | 8,264 | 7,589,700 | 352,579 | | |
| Croaker | | | | | 400 | 12 | | |
| Cunner | | | | | 100 | 2 | | |
| Cusk | | | | | 100 | 2 | | |
| Eels: | | | | | | | | |
| Common | 8,400 | 632 | 6,000 | 360 | | | 2,000 | 120 |
| Conger | | | | | 11,400 | 216 | | |
| Flounders: | | | | | | | | |
| Gray sole | | | | | 51,800 | 3,365 | | |
| Lemon sole | | | | | 613,300 | 47,980 | | |
| Yellowtail and dab | 4,300 | 98 | | | 2,412,600 | 54,773 | | |
| Blackback | 319,900 | 15,995 | 5,700 | 285 | 5,069,600 | 240,797 | | |
| Fluke | 629,800 | 53,298 | 173,900 | 15,612 | 1,351,700 | 111,774 | | |
| Unclassified | | | | | 33,500 | 1,665 | | |
| Frigate mackerel | | | 8,000 | 160 | | | | |
| Grayfish | | | | | 300 | 5 | | |

## *Fisheries of New York, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Kings | | Nassau | | New York | | Orange | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Groupers | | | | | 4,500 | $225 | | |
| Haddock | | | | | 11,105,400 | 414,174 | | |
| Hake | 9,900 | $217 | 1,900 | $39 | 312,000 | 7,743 | | |
| Halibut | | | | | 47,800 | 5,977 | | |
| Herring, sea | | | | | 700 | 13 | | |
| King whiting or "kingfish" | | | 2,000 | 40 | | | | |
| Mackerel | 9,200 | 186 | 165,600 | 4,686 | 721,200 | 24,847 | | |
| Pollock | | | | | 218,400 | 3,993 | | |
| Scup | 30,700 | 743 | 87,400 | 2,318 | 684,500 | 17,879 | | |
| Sea bass | | | 80,500 | 7,634 | 103,200 | 6,511 | | |
| Sea robin | 2,000 | 40 | 500 | 9 | | | | |
| Shad | | | 2,500 | 150 | | | 29,500 | $1,475 |
| Sharks | 400 | 5 | | | 700 | 8 | | |
| Skates | 17,000 | 257 | | | 11,900 | 232 | | |
| Snapper, red | | | | | 3,800 | 190 | | |
| Spanish mackerel | | | 100 | 3 | | | | |
| Squeteagues or "sea trout," gray | | | 160,300 | 10,558 | 10,000 | 755 | | |
| Striped bass | | | 7,400 | 850 | 800 | 91 | 400 | 60 |
| Sturgeon | | | | | 1,000 | 186 | | |
| Suckers | | | | | | | 1,100 | 33 |
| Swordfish | | | | | 16,500 | 3,041 | | |
| Tautog | | | | | 200 | 5 | | |
| Tilefish | | | | | 807,600 | 24,445 | | |
| Tomcod | | | | | | | 300 | 18 |
| Tuna | | | | | 500 | 10 | | |
| White perch | | | | | | | 600 | 24 |
| Whiting | 2,678,200 | 43,403 | 498,100 | 8,081 | 350,100 | 5,902 | | |
| Wolffish | | | | | 6,200 | 169 | | |
| Crabs: | | | | | | | | |
| Hard | 6,200 | 270 | 30,100 | 1,565 | | | | |
| Soft and peelers | | | 22,400 | 8,442 | | | | |
| Lobsters | 84,200 | 15,998 | 2,300 | 654 | 17,300 | 3,305 | | |
| Clams: | | | | | | | | |
| Hard, public | | | 252,300 | 45,119 | | | | |
| Soft, public | | | 180,600 | 17,198 | | | | |
| Surf or skimmer | 605,600 | 37,844 | 203,200 | 13,693 | | | | |
| Conchs | 7,000 | 695 | | | | | | |
| Mussels, sea | | | 94,500 | 7,091 | 53,300 | 4,066 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | | | 10,400 | 2,348 | | | | |
| Public, fall | | | 2,500 | 545 | | | | |
| Private, spring | | | 1,460,000 | 336,023 | | | | |
| Private, fall | | | 1,542,300 | 359,578 | | | | |
| Scallops, sea | | | | | 2,944,800 | 350,242 | | |
| Squid | 55,600 | 1,001 | 102,900 | 2,053 | 102,300 | 2,020 | | |
| Bloodworms | 3,500 | 3,150 | 3,900 | 4,170 | | | | |
| Sandworms | 4,400 | 4,060 | 8,100 | 8,805 | | | | |
| Total | 4,707,600 | 185,859 | 5,501,400 | 875,712 | 36,338,100 | 1,755,127 | 46,300 | 2,454 |

| Species | Putnam | | Rensselaer | | Rockland | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 2,400 | $24 | 3,700 | $37 | 6,100 | $62 |
| Carp | 6,400 | 384 | 67,400 | 2,064 | 3,900 | 291 |
| Catfish and bullheads | 700 | 115 | 1,800 | 252 | 500 | 71 |
| Eels, common | 800 | 52 | | | 58,100 | 3,488 |
| Shad | 13,000 | 685 | 200 | 40 | 157,700 | 8,676 |
| Smelt | 400 | 24 | | | | |
| Striped bass | | | | | 16,200 | 2,241 |
| Suckers | 300 | 9 | 500 | 15 | 500 | 15 |
| White perch | 900 | 28 | | | 10,500 | 319 |
| Yellow perch | | | 200 | 10 | | |
| Total | 24,900 | 1,321 | 73,800 | 2,418 | 253,500 | 15,163 |

## *Fisheries of New York, 1938*—Continued

### CATCH: BY COUNTIES—Continued

| Species | Suffolk | | Ulster | | Westchester | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 22,700 | $217 | 3,300 | $33 | 2,600 | $26 |
| Anchovies | 9,600 | 288 | | | | |
| Bluefish | 140,700 | 16,311 | | | | |
| Bonito | 100,400 | 5,227 | | | | |
| Butterfish | 2,750,800 | 106,920 | | | | |
| Carp | | | 36,100 | 2,143 | 17,000 | 1,018 |
| Catfish and bullheads | | | 6,300 | 769 | 6,000 | 716 |
| Cod | 516,900 | 25,827 | | | | |
| Cunner | 2,200 | 44 | | | | |
| Eels, common | 93,600 | 5,616 | 1,700 | 104 | 46,800 | 2,824 |
| Flounders: | | | | | | |
| Yellowtail and dab | 593,700 | 11,824 | | | | |
| Blackback | 753,900 | 37,570 | | | | |
| Fluke | 296,700 | 28,125 | | | | |
| Frigate mackerel | 3,500 | 72 | | | | |
| Haddock | 2,000 | 80 | | | | |
| Herring, sea | 13,700 | 274 | | | | |
| Hickory shad | 2,300 | 40 | | | | |
| Kingfish or "king mackerel" | 40,100 | 2,191 | | | | |
| King whiting or "kingfish" | 300 | 15 | | | | |
| Mackerel | 890,200 | 35,644 | | | | |
| Menhaden | 22,632,600 | 102,597 | | | | |
| Pollock | 87,300 | 1,753 | | | | |
| Scup | 1,689,300 | 40,874 | | | | |
| Sea bass | 101,000 | 8,018 | | | | |
| Sea robin | 9,200 | 182 | | | | |
| Shad | 96,300 | 4,900 | 319,600 | 18,561 | 236,700 | 13,733 |
| Sharks | 9,900 | 59 | | | | |
| Skates | 2,100 | 23 | | | | |
| Spanish mackerel | 100 | 3 | | | | |
| Squeteagues or "sea trout," gray | 886,600 | 65,767 | | | | |
| Striped bass | 100,700 | 12,473 | 700 | 98 | 11,600 | 1,234 |
| Sturgeon | 300 | 38 | 1,100 | 315 | 700 | 175 |
| Suckers | | | 2,500 | 68 | 3,000 | 90 |
| Sunfish | | | 100 | 2 | 200 | 5 |
| Swellfish | 57,200 | 2,000 | | | | |
| Swordfish | 35,000 | 6,550 | | | | |
| Tautog | 11,400 | 451 | | | | |
| Tomcod | | | | | 4,000 | 160 |
| Tuna | 147,600 | 6,666 | | | | |
| White perch | | | 3,800 | 143 | 13,900 | 500 |
| Whiting | 429,500 | 6,869 | | | | |
| Crabs: | | | | | | |
| Hard | 351,000 | 21,916 | | | | |
| Soft and peelers | 12,000 | 5,490 | | | | |
| Lobsters | 140,600 | 33,340 | | | | |
| Shrimp | 125,000 | 21,250 | | | | |
| Clams: | | | | | | |
| Hard, public | 1,756,200 | 307,288 | | | | |
| Hard, private | 234,900 | 40,938 | | | | |
| Soft, public | 191,200 | 16,730 | | | | |
| Mussels, sea | 93,000 | 6,978 | | | | |
| Oysters, market: | | | | | | |
| Public, spring | 199,600 | 46,996 | | | | |
| Public, fall | 197,800 | 46,564 | | | | |
| Private, spring | 3,693,900 | 548,368 | | | | |
| Private, fall | 3,100,100 | 616,807 | | | | |
| Scallops, bay | 21,100 | 6,003 | | | | |
| Squid | 498,100 | 9,178 | | | | |
| Turtle, snapper | 35,500 | 2,480 | | | | |
| Bloodworms | 15,500 | 14,300 | | | | |
| Sandworms | 14,300 | 12,155 | | | | |
| Total | 43,209,200 | 2,292,292 | 375,200 | 22,236 | 342,500 | 20,481 |

## NEW JERSEY

### *Fisheries of New Jersey, 1938*

OPERATING UNITS: BY GEAR

| Item | Purse seines |  | Haul seines | Gill nets |  |  |  |
|---|---|---|---|---|---|---|---|
|  | Menhaden | Other |  | Anchor | Drift | Runaround | Stake |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 85 | 113 | ----- | ----- | 10 | ----- | 2 |
| On boats and shore: |  |  |  |  |  |  |  |
| Regular | ----- | ----- | 52 | 14 | 98 | 137 | 157 |
| Casual | ----- | ----- | 211 | 4 | 68 | 18 | 325 |
| Total | 85 | 113 | 263 | 18 | 176 | 155 | 484 |
| Vessels, motor | 4 | 10 | ----- | ----- | 3 | ----- | 1 |
| Net tonnage | 110 | 242 | ----- | ----- | 32 | ----- | 7 |
| Boats: |  |  |  |  |  |  |  |
| Motor | ----- | ----- | ----- | 8 | 63 | 66 | 34 |
| Other | ----- | ----- | 105 | ----- | 20 | ----- | 184 |
| Accessory boats | 12 | 24 | ----- | ----- | 1 | ----- | ----- |
| Apparatus: |  |  |  |  |  |  |  |
| Number | 4 | 10 | 105 | 40 | 880 | 66 | 1,371 |
| Length, yards | 1,150 | 3,390 | 9,934 | ----- | ----- | ----- | ----- |
| Square yards | ----- | ----- | ----- | 20,400 | 558,407 | 244,510 | 354,865 |

| Item | Lines |  |  |  | Pound nets | Weirs | Stop nets | Fyke nets |
|---|---|---|---|---|---|---|---|---|
|  | Hand | Trawl | Troll | Trot with baits or snoods |  |  |  |  |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 15 | 37 | 14 | ----- | 264 | ----- | ----- | ----- |
| On boats and shore: |  |  |  |  |  |  |  |  |
| Regular | 178 | 155 | 69 | 24 | 97 | ----- | 24 | 30 |
| Casual | 34 | 14 | 42 | 2 | 22 | 20 | 70 | 78 |
| Total | 227 | 206 | 125 | 26 | 383 | 20 | 94 | 108 |
| Vessels, motor | 4 | 15 | 3 | ----- | 38 | ----- | ----- | ----- |
| Net tonnage | 50 | 141 | 42 | ----- | 234 | ----- | ----- | ----- |
| Boats: |  |  |  |  |  |  |  |  |
| Motor | 92 | 76 | 81 | 24 | 20 | 7 | 14 | 20 |
| Other | 6 | 4 | ----- | ----- | 11 | 1 | 37 | 42 |
| Accessory boats | 10 | 7 | 8 | ----- | ----- | ----- | ----- | ----- |
| Apparatus: |  |  |  |  |  |  |  |  |
| Number | 260 | 474 | 340 | 24 | 175 | 99 | 61 | 814 |
| Square yards | ----- | ----- | ----- | ----- | ----- | ----- | 60,700 | ----- |
| Hooks, baits, or snoods | 425 | 274,300 | 340 | 21,150 | ----- | ----- | ----- | ----- |

| Item | Dip nets | Cast nets | Drop nets | Otter trawls, fish | Wire baskets | Pots |  |  |
|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  | Crab | Eel | Fish |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | ----- | ----- | ----- | 118 | ----- | ----- | ----- | ----- |
| On boats and shore: |  |  |  |  |  |  |  |  |
| Regular | 94 | ----- | ----- | 62 | ----- | 2 | 20 | 63 |
| Casual | 12 | 3 | 1 | 2 | 1 | ----- | 23 | 2 |
| Total | 106 | 3 | 1 | 182 | 1 | 2 | 43 | 65 |
| Vessels, motor | ----- | ----- | ----- | 31 | ----- | ----- | ----- | ----- |
| Net tonnage | ----- | ----- | ----- | 619 | ----- | ----- | ----- | ----- |
| Boats: |  |  |  |  |  |  |  |  |
| Motor | 2 | ----- | ----- | 32 | ----- | 1 | 17 | 41 |
| Other | 101 | 3 | 1 | ----- | 1 | ----- | 13 | ----- |
| Apparatus: |  |  |  |  |  |  |  |  |
| Number | 106 | 3 | 1 | 63 | 3 | 10 | 1,244 | 9,505 |
| Yards at mouth | ----- | ----- | ----- | 1,452 | ----- | ----- | ----- | ----- |

## *Fisheries of New Jersey, 1938*—Continued

### OPERATING UNITS: BY GEAR—Continued

| Item | Pots—Contd. | Spears | Dredges | | | | Tongs | |
|---|---|---|---|---|---|---|---|---|
| | Lobster | | Clam | Crab | Oyster | Scallop | Oyster | Other |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | ------- | ------- | 42 | 21 | 480 | 14 | ------- | ------- |
| On boats and shore: | | | | | | | | |
| Regular | 56 | 3 | 14 | 13 | 22 | ------- | 168 | 306 |
| Casual | 13 | 9 | 3 | 2 | 9 | ------- | 17 | 198 |
| Total | 69 | 12 | 59 | 36 | 511 | 14 | 185 | 504 |
| Vessels: | | | | | | | | |
| Motor | ------- | ------- | 15 | 9 | 83 | 2 | ------- | ------- |
| Net tonnage | ------- | ------- | 167 | 96 | 1,559 | 58 | ------- | ------- |
| Sail | ------- | ------- | 3 | ------- | 1 | ------- | ------- | ------- |
| Net tonnage | ------- | ------- | 30 | ------- | 8 | ------- | ------- | ------- |
| Total vessels | ------- | ------- | 18 | 9 | 84 | 2 | ------- | ------- |
| Total net tonnage | ------- | ------- | 197 | 96 | 1,567 | 58 | ------- | ------- |
| Boats: | | | | | | | | |
| Motor | 34 | ------- | 10 | 8 | 15 | ------- | 93 | 265 |
| Other | ------- | 11 | ------- | ------- | ------- | ------- | 61 | 216 |
| Apparatus: | | | | | | | | |
| Number | 6,075 | 12 | 65 | 64 | 198 | 4 | 166 | 504 |
| Yards at mouth | ------- | ------- | 68 | 98 | 245 | 14 | ------- | ------- |

| Item | Rakes | | Forks | Hoes | By hand | | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|
| | Oyster | Other | | | Oyster | Other | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | ------- | ------- | ------- | ------- | ------- | ------- | 1,097 |
| On boats and shore: | | | | | | | |
| Regular | 30 | 355 | ------- | 146 | 9 | 110 | 997 |
| Casual | 3 | 413 | 1 | 86 | 7 | 178 | 1,517 |
| Total | 33 | 768 | 1 | 232 | 16 | 288 | 3,611 |
| Vessels: | | | | | | | |
| Motor | ------- | ------- | ------- | ------- | ------- | ------- | 186 |
| Net tonnage | ------- | ------- | ------- | ------- | ------- | ------- | 2,863 |
| Sail | ------- | ------- | ------- | ------- | ------- | ------- | 3 |
| Net tonnage | ------- | ------- | ------- | ------- | ------- | ------- | 30 |
| Total vessels | ------- | ------- | ------- | ------- | ------- | ------- | 189 |
| Total net tonnage | ------- | ------- | ------- | ------- | ------- | ------- | 2,893 |
| Boats: | | | | | | | |
| Motor | 26 | 282 | 1 | 52 | 1 | 57 | 889 |
| Other | 5 | 468 | ------- | 175 | 13 | 211 | 1,268 |
| Accessory boats | ------- | ------- | ------- | ------- | ------- | ------- | 55 |
| Apparatus, number | 33 | 768 | 1 | 232 | ------- | ------- | ------- |

*Fisheries of New Jersey, 1938*—Continued

CATCH: BY GEAR

| Species | Purse seines | | | | Haul seines | |
|---|---|---|---|---|---|---|
| | Menhaden | | Other | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | 8,000 | $120 |
| Bluefish | | | 80,800 | $5,154 | | |
| Bonito | | | 6,700 | 253 | | |
| Butterfish | | | 37,000 | 1,128 | | |
| Carp | | | | | 144,000 | 10,439 |
| Catfish and bullheads | | | | | 39,500 | 1,473 |
| Cod | | | 800 | 25 | | |
| Croaker | | | 1,745,200 | 19,772 | 1,700 | 65 |
| Eels: | | | | | | |
| Common | | | | | 9,900 | 1,582 |
| Conger | | | 1,200 | 18 | | |
| Flounders: | | | | | | |
| Blackback | | | | | 1,100 | 98 |
| Fluke | | | 33,500 | 3,084 | | |
| Frigate mackerel | | | 400 | 8 | | |
| Hake | | | 900 | 14 | | |
| Herring, sea | | | 1,400 | 16 | | |
| Mackerel | | | 52,500 | 1,945 | | |
| Menhaden | 41,041,000 | $139,891 | 929,600 | 3,527 | | |
| Scup | | | 1,171,500 | 15,564 | | |
| Sea bass | | | 13,300 | 438 | | |
| Sea robin | | | 1,300 | 15 | | |
| Shad | | | | | 205,800 | 19,830 |
| Squeteagues or "sea trout," gray | | | 729,700 | 13,842 | 4,700 | 228 |
| Striped bass | | | 1,000 | 79 | 25,100 | 3,048 |
| Suckers | | | | | 49,900 | 1,887 |
| White perch | | | | | 12,700 | 1,186 |
| Whiting | | | 14,600 | 290 | | |
| Yellow perch | | | | | 700 | 56 |
| Crabs: | | | | | | |
| Hard | | | | | 4,300 | 221 |
| Soft and peelers | | | | | 16,900 | 5,315 |
| Squid | | | 3,600 | 41 | | |
| Total | 41,041,000 | 139,891 | 4,825,000 | 65,213 | 524,300 | 45,548 |

| Species | Gill nets | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Anchor | | Drift | | Runaround | | Stake | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | | | 12,100 | $724 | 140,600 | $11,090 | 1,000 | $240 |
| Bonito | | | 800 | 56 | | | | |
| Butterfish | | | 600 | 24 | 100 | 2 | | |
| Carp | | | | | | | 6,300 | 504 |
| Croaker | | | 19,200 | 391 | 2,500 | 25 | | |
| Flounders, blackback | | | | | | | 600 | 18 |
| Mackerel | 1,600 | $119 | 368,400 | 17,607 | 10,700 | 477 | | |
| Scup | | | | | 20,000 | 400 | | |
| Shad | 5,800 | 1,167 | 146,900 | 17,462 | | | 1,531,300 | 127,253 |
| Spot | | | 10,000 | 200 | | | 7,000 | 140 |
| Squeteagues or "sea trout," gray | | | 13,500 | 811 | 499,400 | 20,121 | 2,500 | 60 |
| Striped bass | | | 500 | 75 | | | 87,200 | 9,925 |
| White perch | | | | | | | 3,600 | 404 |
| Total | 7,400 | 1,286 | 572,000 | 37,350 | 673,300 | 32,115 | 1,639,500 | 138,544 |

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## *Fisheries of New Jersey, 1938*—Continued

CATCH: BY GEAR—Continued

| Species | Lines | | | | | | Trot with bait or snoods | |
|---|---|---|---|---|---|---|---|---|
| | Hand | | Trawl | | Troll | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Amberjack | 800 | $16 | | | | | | |
| Bluefish | 234,100 | 19,604 | | | 363,200 | $29,282 | | |
| Bonito | 100 | 6 | | | 23,200 | 1,153 | | |
| Cod | 15,100 | 612 | 1,910,400 | $63,982 | | | | |
| Croaker | 18,400 | 691 | | | | | | |
| Eels: | | | | | | | | |
| Common | 1,800 | 180 | | | | | | |
| Conger | 100 | 1 | | | | | | |
| Flounders, fluke | 2,600 | 251 | 17,400 | 1,392 | | | | |
| Grayfish | | | 300 | 4 | | | | |
| Groupers | 12,500 | 368 | | | | | | |
| Kingfish or "king mackerel" | | | | | 100,000 | 3,000 | | |
| Mackerel | | | | | 41,800 | 2,939 | | |
| Scup | 18,500 | 285 | | | | | | |
| Sea bass | 224,300 | 15,674 | | | | | | |
| Skates | | | 2,400 | 20 | | | | |
| Snapper, red | 28,200 | 1,808 | | | | | | |
| Squeteagues or "sea trout," gray | 23,600 | 1,468 | | | 11,400 | 541 | | |
| Squirrel hake | | | 9,000 | 98 | | | | |
| Striped bass | 100 | 15 | | | 600 | 65 | | |
| Tautog | 3,000 | 184 | | | | | | |
| Tuna | | | | | 2,800 | 100 | | |
| Crabs, hard | | | | | | | 269,800 | $5,875 |
| Turtles, snapper | | | | | | | 1,000 | 50 |
| Total | 583,200 | 41,163 | 1,939,500 | 65,496 | 543,000 | 37,080 | 270,800 | 5,925 |

| Species | Pound nets | | Weirs | | Stop nets | | Fyke nets | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 100 | $1 | | | | | | |
| Bluefish | 199,500 | 14,636 | | | | | | |
| Bonito | 663,000 | 23,885 | | | | | | |
| Butterfish | 3,449,100 | 116,190 | | | | | | |
| Carp | | | | | 228,700 | $17,906 | | |
| Catfish and bullheads | | | | | 34,200 | 1,963 | 46,900 | $2,159 |
| Cod | 206,500 | 5,873 | | | | | | |
| Croaker | 3,282,000 | 36,034 | | | | | | |
| Drum: | | | | | | | | |
| Black | 1,500 | 21 | | | | | | |
| Red or redfish | 4,600 | 47 | | | | | | |
| Eels: | | | | | | | | |
| Common | 16,500 | 2,159 | | | | | 33,300 | 3,502 |
| Conger | 6,600 | 66 | | | | | | |
| Flounders: | | | | | | | | |
| Blackback | 19,900 | 553 | | | | | 71,800 | 2,644 |
| Fluke | 317,000 | 26,380 | | | | | | |
| Frigate mackerel | 60,600 | 606 | | | | | | |
| Goosefish | 2,500 | 25 | | | | | | |
| Grayfish | 101,200 | 1,008 | | | | | | |
| Hake | 4,600 | 53 | | | | | | |
| Herring, sea | 1,153,900 | 6,478 | | | | | | |
| Hickory shad | 27,000 | 198 | | | | | | |
| King whiting or "kingfish" | 92,200 | 3,764 | | | | | | |
| Mackerel | 1,644,200 | 58,782 | | | | | | |
| Menhaden | 6,129,000 | 20,822 | | | | | | |
| Mullet | 200 | 2 | | | | | | |
| Pollock | 100,600 | 2,142 | | | | | | |
| Sand perch | 1,000 | 10 | | | | | | |
| Scup | 2,403,100 | 23,807 | | | | | | |
| Sea bass | 100,500 | 4,329 | | | | | | |
| Sea robin | 62,100 | 621 | | | | | | |
| Shad | 602,200 | 56,768 | | | | | | |
| Sharks | 129,900 | 1,904 | | | | | | |
| Silversides | 1,500 | 15 | | | | | | |
| Skates | 97,400 | 517 | | | | | | |
| Spanish mackerel | 9,400 | 795 | | | | | | |
| Spot | 164,000 | 3,024 | | | | | | |
| Squeteagues or "sea trout," gray | 4,724,900 | 112,853 | | | | | | |
| Squirrel hake | 151,200 | 1,512 | | | | | | |
| Striped bass | 4,900 | 506 | | | 2,500 | 375 | 16,400 | 1,898 |
| Sturgeon | 3,600 | 470 | | | | | | |
| Suckers | | | | | 300 | 18 | | |

## *Fisheries of New Jersey, 1938*—Continued

CATCH: BY GEAR—Continued

| Species | Pound nets | | Weirs | | Stop nets | | Fyke nets | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Swellfish | 1,500 | $15 | | | | | | |
| Tautog | 21,300 | 397 | | | | | | |
| Tuna | 104,700 | 3,176 | | | | | | |
| White perch | | | | | 300 | $45 | 2,900 | $320 |
| Whiting | 5,909,800 | 45,097 | | | | | | |
| Yellow perch | | | | | | | 2,500 | 250 |
| Crabs: | | | | | | | | |
| Hard | 52,300 | 853 | | | | | | |
| King | 1,276.000 | 2,871 | 1,176,000 | $2,806 | | | 8,000 | 30 |
| Soft and peelers | 300 | 100 | | | | | | |
| Lobsters | 100 | 20 | | | | | | |
| Squid | 1,105,000 | 16,187 | | | | | | |
| Turtles: | | | | | | | | |
| Green | 3,900 | 39 | | | | | | |
| Loggerhead | 5,500 | 55 | | | | | | |
| Snapper | | | | | | | 7,700 | 847 |
| Total | 34,418,400 | 595,666 | 1,176,000 | 2,806 | 266,000 | 20,307 | 189,500 | 11,650 |

| Species | Dip nets | | Cast nets | | Drop nets | | Otter trawls | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | | | | | | | 7,000 | $648 |
| Bonito | | | | | | | 100 | 4 |
| Butterfish | | | | | | | 616,700 | 18,168 |
| Carp | | | 4,700 | $422 | | | | |
| Cod | | | | | | | 119,500 | 3,863 |
| Croaker | | | | | | | 690,000 | 12,380 |
| Drum, red or redfish | | | | | | | 600 | 5 |
| Eels, conger | | | | | | | 17,800 | 216 |
| Flounders: | | | | | | | | |
| Gray sole | | | | | | | 1,900 | 37 |
| Lemon sole | | | | | | | 26,600 | 1,548 |
| Yellowtail and dab | | | | | | | 301,800 | 5,139 |
| Blackback | | | | | | | 88,000 | 2,962 |
| Fluke | | | | | | | 1,712,600 | 136,525 |
| Grayfish | | | | | | | 400 | 4 |
| Groupers | | | | | | | 100 | 2 |
| Haddock | | | | | | | 1,500 | 14 |
| Hake | | | | | | | 35,200 | 748 |
| Herring, sea | | | | | | | 5,500 | 54 |
| King whiting or "kingfish" | | | | | | | 10,300 | 383 |
| Launce | | | | | | | 100 | 3 |
| Mackerel | | | | | | | 17,200 | 1,264 |
| Menhaden | | | | | | | 1,400 | 6 |
| Pollock | | | | | | | 600 | 10 |
| Sand perch | | | | | | | 100 | 2 |
| Scup | | | | | | | 1,336,800 | 20,766 |
| Sea bass | | | | | | | 463,600 | 23,953 |
| Sea robin | | | | | | | 9,800 | 118 |
| Sharks | | | | | | | 300 | 8 |
| Skates | | | | | | | 8,000 | 70 |
| Spot | | | | | | | 2,600 | 63 |
| Squeteagues or "sea trout," gray | | | | | | | 279,000 | 6,881 |
| Squirrel hake | | | | | | | 600 | 8 |
| Striped bass | | | | | | | 8,700 | 1,439 |
| Sturgeon | | | | | | | 1,500 | 182 |
| Tautog | | | | | | | 1,200 | 21 |
| Tilefish | | | | | | | 100 | 4 |
| Whiting | | | | | | | 304,100 | 4,748 |
| Crabs: | | | | | | | | |
| Hard | 134,500 | $15,520 | | | 1,600 | $162 | 400 | 25 |
| Soft and peelers | 296,400 | 97,227 | | | | | | |
| Lobsters | | | | | | | 10,800 | 1,183 |
| Scallops, sea | | | | | | | 100 | 21 |
| Squid | | | | | | | 179,400 | 3,215 |
| Total | 430,900 | 112,747 | 4,700 | 422 | 1,600 | 162 | 6,262,000 | 246,690 |

## *Fisheries of New Jersey, 1938*—Continued

### CATCH: By gear—Continued

| Species | Wire baskets | | Pots | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Crab | | Eel | | Fish | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels: | | | | | | | | |
| Common | | | | | 64,600 | $6,152 | | |
| Conger | | | | | | | 800 | $8 |
| Hake | | | | | | | 400 | 5 |
| Scup | | | | | | | 400 | 7 |
| Sea bass | | | | | | | 1,155,700 | 59,372 |
| Squirrel hake | | | | | | | 900 | 9 |
| Tautog | | | | | | | 5,100 | 95 |
| Crabs: | | | | | | | | |
| Hard | 300 | $25 | 12,000 | $750 | | | | |
| Soft and peelers | | | 6,000 | 1,125 | | | | |
| Lobsters | | | | | | | 68,600 | 13,304 |
| Total | 300 | 25 | 18,000 | 1,875 | 64,600 | 6,152 | 1,231,900 | 72,800 |

| Species | Pots, lobster | | Spears | | Dredges | | Tongs | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod | 100 | $3 | | | | | | |
| Eels, common | | | 3,200 | $366 | | | | |
| Sea bass | 7,000 | 421 | | | | | | |
| Crabs, hard | | | | | 574,300 | $8,381 | 800 | $40 |
| Lobsters | 247,400 | 33,071 | | | | | | |
| Clams: | | | | | | | | |
| Hard, public | | | | | 115,600 | 14,040 | 625,400 | 79,513 |
| Hard, private | | | | | 41,900 | 5,374 | 141,500 | 18,366 |
| Surf or skimmer | | | | | 804,900 | 20,301 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | | | | | 8,000 | 1,000 | 2,000 | 434 |
| Public, fall | | | | | 14,200 | 1,421 | 90,100 | 8,770 |
| Private, spring | | | | | 2,651,500 | 323,280 | 73,700 | 15,474 |
| Private, fall | | | | | 2,818,000 | 347,368 | 73,600 | 15,272 |
| Scallops, sea | | | | | 113,900 | 8,769 | | |
| Total | 254,500 | 33,495 | 3,200 | 366 | 7,142,300 | 729,934 | 1,007,100 | 137,869 |

| Species | Rakes | | Forks | | Hoes | | By hand | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs, hard | 63,000 | $574 | | | | | | |
| Clams: | | | | | | | | |
| Hard, public | 1,579,700 | 205,813 | | | | | 390,000 | $49,144 |
| Hard, private | 14,500 | 1,959 | | | | | 16,300 | 1,837 |
| Soft, public | | | 4,000 | $200 | 870,700 | $54,223 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 10,200 | 1,130 | | | | | 700 | 165 |
| Public, fall | 9,300 | 1,108 | | | | | 700 | 165 |
| Private, spring | 13,800 | 2,760 | | | | | 6,900 | 1,416 |
| Private, fall | 13,300 | 2,844 | | | | | 11,800 | 2,346 |
| Total | 1,703,800 | 216,188 | 4,000 | 200 | 870,700 | 54,223 | 426,400 | 55,073 |

### OPERATING UNITS: By counties

| Item | Atlantic | Bergen | Burlington | Camden | Cape May | Cumberland | Gloucester |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 53 | 2 | 8 | | 313 | 457 | |
| On boats and shore: | | | | | | | |
| Regular | 173 | 2 | 25 | | 141 | 9 | 2 |
| Casual | 172 | 152 | 59 | 20 | 207 | 59 | 29 |
| Total | 398 | 156 | 92 | 20 | 661 | 525 | 31 |
| Vessels, motor | 16 | 1 | 2 | | 53 | 76 | |
| Net tonnage | 209 | 15 | 22 | | 814 | 1,487 | |

*Fisheries of New Jersey, 1938*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Atlantic | Bergen | Burlington | Camden | Cape May | Cumberland | Gloucester |
|---|---|---|---|---|---|---|---|
| Boats: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Motor | 133 | 1 | 23 |  | 134 | 77 | 5 |
| Other | 197 | 44 | 32 | 10 | 198 | 83 | 13 |
| Accessory boats | 3 |  |  |  | 43 |  |  |
| Apparatus: |  |  |  |  |  |  |  |
| Purse seines: |  |  |  |  |  |  |  |
| Menhaden |  |  |  |  | 1 |  |  |
| Length, yards |  |  |  |  | 310 |  |  |
| Other | 1 |  |  |  | 9 |  |  |
| Length, yards | 360 |  |  |  | 3,030 |  |  |
| Haul seines | 18 |  | 12 | 10 | 5 | 14 | 4 |
| Length, yards | 1,634 |  | 1,190 | 880 | 343 | 1,400 | 285 |
| Gill nets: |  |  |  |  |  |  |  |
| Anchor |  |  |  |  | 25 |  |  |
| Square yards |  |  |  |  | 10,700 |  |  |
| Drift | 75 | 1 | 10 |  | 612 | 14 | 2 |
| Square yards | 30,620 | 1,360 | 12,660 |  | 271,867 | 27,800 | 7,200 |
| Runaround |  |  |  |  | 5 |  |  |
| Square yards |  |  |  |  | 20,800 |  |  |
| Stake | 104 | 36 | 17 |  | 12 | 151 |  |
| Square yards | 27,550 | 60,280 | 3,520 |  | 2,400 | 15,100 |  |
| Lines: |  |  |  |  |  |  |  |
| Hand | 7 |  |  |  | 135 | 2 |  |
| Hooks | 13 |  |  |  | 264 | 2 |  |
| Trawl | 110 |  |  |  | 220 |  |  |
| Hooks | 88,700 |  |  |  | 117,800 |  |  |
| Troll | 6 |  |  |  | 199 |  |  |
| Hooks | 6 |  |  |  | 199 |  |  |
| Trot with baits or snoods |  |  |  |  |  | 23 |  |
| Baits or snoods |  |  |  |  |  | 20,950 |  |
| Pound nets | 2 |  |  |  | 63 |  |  |
| Weirs |  |  |  |  | 74 | 25 |  |
| Stop nets |  |  | 7 | 2 |  | 9 | 9 |
| Yards at mouth |  |  | 9,575 | 3,400 |  | 9,250 | 17,400 |
| Fyke nets | 57 |  | 77 |  | 19 | 67 | 174 |
| Dip nets | 15 |  |  |  | 1 |  |  |
| Cast nets |  |  |  |  |  |  | 2 |
| Drop nets |  |  |  |  | 1 |  |  |
| Otter trawls, fish | 14 |  |  |  | 44 |  |  |
| Yards at mouth | 306 |  |  |  | 1,047 |  |  |
| Pots: |  |  |  |  |  |  |  |
| Eel | 37 |  | 25 |  | 105 | 55 |  |
| Fish | 300 |  |  |  | 3,235 |  |  |
| Spears |  |  |  |  | 2 |  |  |
| Dredges: |  |  |  |  |  |  |  |
| Clam | 1 |  |  |  | 13 | 2 |  |
| Yards at mouth | 1 |  |  |  | 13 | 3 |  |
| Crab |  | 2 |  |  |  |  |  |
| Yards at mouth |  | 4 |  |  |  |  |  |
| Oyster | 16 |  | 12 |  |  | 152 |  |
| Yards at mouth | 18 |  | 14 |  |  | 189 |  |
| Scallop | 4 |  |  |  |  |  |  |
| Yards at mouth | 14 |  |  |  |  |  |  |
| Tongs: |  |  |  |  |  |  |  |
| Oyster | 26 |  | 9 |  | 12 | 103 |  |
| Other | 161 |  | 24 |  | 136 |  |  |
| Rakes: |  |  |  |  |  |  |  |
| Oyster | 12 |  |  |  | 2 | 1 |  |
| Other | 157 |  |  |  | 134 | 4 |  |
| Hoes | 10 |  |  |  |  |  |  |

## *Fisheries of New Jersey, 1938*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Hudson | Hunterdon | Mercer | Middlesex | Monmouth | Ocean | Salem |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 2 | -------- | -------- | 2 | 110 | 150 | -------- |
| On boats and shore: | | | | | | | |
| Regular | -------- | -------- | -------- | 9 | 393 | 233 | 10 |
| Casual | -------- | 27 | 21 | 5 | 325 | 380 | 61 |
| Total | 2 | 27 | 21 | 16 | 828 | 763 | 71 |
| Vessels: | | | | | | | |
| Motor | 1 | -------- | -------- | -------- | 14 | 23 | -------- |
| Net tonnage | 9 | -------- | -------- | -------- | 165 | 142 | -------- |
| Sail | -------- | -------- | -------- | 1 | 2 | -------- | -------- |
| Net tonnage | -------- | -------- | -------- | 8 | 22 | -------- | -------- |
| Total vessels | 1 | -------- | -------- | 1 | 16 | 23 | -------- |
| Total net tonnage | 9 | -------- | -------- | 8 | 187 | 142 | -------- |
| Boats: | | | | | | | |
| Motor | -------- | -------- | -------- | 8 | 204 | 284 | 20 |
| Other | -------- | 6 | 4 | 6 | 427 | 224 | 24 |
| Accessory boats | -------- | -------- | -------- | -------- | 9 | -------- | -------- |
| Apparatus: | | | | | | | |
| Purse seines, menhaden | -------- | -------- | -------- | -------- | 3 | -------- | -------- |
| Length, yards | -------- | -------- | -------- | -------- | 840 | -------- | -------- |
| Haul seines | -------- | 6 | 4 | 1 | 7 | 10 | 14 |
| Length, yards | -------- | 1,111 | 600 | 30 | 259 | 672 | 1,530 |
| Gill nets: | | | | | | | |
| Anchor | -------- | -------- | -------- | 3 | 12 | -------- | -------- |
| Square yards | -------- | -------- | -------- | 2,500 | 7,200 | -------- | -------- |
| Drift | -------- | -------- | -------- | -------- | 120 | 29 | 17 |
| Square yards | -------- | -------- | -------- | -------- | 70,600 | 40,900 | 95,400 |
| Runaround | -------- | -------- | -------- | 6 | 34 | 21 | -------- |
| Square yards | -------- | -------- | -------- | 16,470 | 126,640 | 80,600 | -------- |
| Stake | -------- | -------- | -------- | 14 | 80 | 927 | 30 |
| Square yards | -------- | -------- | -------- | 2,800 | 91,993 | 148,822 | 2,400 |
| Lines: | | | | | | | |
| Hand | -------- | -------- | -------- | -------- | 75 | 41 | -------- |
| Hooks | -------- | -------- | -------- | -------- | 97 | 49 | -------- |
| Trawl | -------- | -------- | -------- | -------- | 6 | 138 | -------- |
| Hooks | -------- | -------- | -------- | -------- | 3,000 | 64,800 | -------- |
| Troll | -------- | -------- | -------- | -------- | 68 | 67 | -------- |
| Hooks | -------- | -------- | -------- | -------- | 68 | 67 | -------- |
| Trot with baits or snoods | -------- | -------- | -------- | -------- | -------- | -------- | 1 |
| Baits or snoods | -------- | -------- | -------- | -------- | -------- | -------- | 200 |
| Pound nets | -------- | -------- | -------- | -------- | 43 | 67 | -------- |
| Stop nets | -------- | -------- | -------- | -------- | -------- | -------- | 34 |
| Square yards | -------- | -------- | -------- | -------- | -------- | -------- | 21,075 |
| Fyke nets | -------- | -------- | 30 | -------- | 50 | 196 | 144 |
| Dip nets | -------- | -------- | -------- | -------- | 87 | 3 | -------- |
| Cast nets | -------- | -------- | -------- | -------- | -------- | -------- | 1 |
| Otter trawls, fish | 1 | -------- | -------- | -------- | 2 | 2 | -------- |
| Yards at mouth | 27 | -------- | -------- | -------- | 24 | 48 | -------- |
| Wire baskets | -------- | -------- | -------- | -------- | -------- | 3 | -------- |
| Pots: | | | | | | | |
| Crab | -------- | -------- | -------- | -------- | -------- | -------- | 10 |
| Eel | -------- | -------- | -------- | 170 | 637 | 215 | -------- |
| Fish | -------- | -------- | -------- | -------- | -------- | 5,970 | -------- |
| Lobster | -------- | -------- | -------- | -------- | 6,075 | -------- | -------- |
| Spears | -------- | -------- | -------- | -------- | 7 | 3 | -------- |
| Dredges: | | | | | | | |
| Clam | -------- | -------- | -------- | 4 | 42 | 3 | -------- |
| Yards at mouth | -------- | -------- | -------- | 5 | 42 | 4 | -------- |
| Crab | -------- | -------- | -------- | -------- | 54 | 8 | -------- |
| Yards at mouth | -------- | -------- | -------- | -------- | 80 | 14 | -------- |
| Oyster | -------- | -------- | -------- | 2 | 2 | 14 | -------- |
| Yards at mouth | -------- | -------- | -------- | 3 | 4 | 17 | -------- |
| Tongs: | | | | | | | |
| Oyster | -------- | -------- | -------- | -------- | -------- | 16 | -------- |
| Other | -------- | -------- | -------- | -------- | 1 | 182 | -------- |
| Rakes: | | | | | | | |
| Oyster | -------- | -------- | -------- | -------- | 15 | 3 | -------- |
| Other | -------- | -------- | -------- | 5 | 303 | 165 | -------- |
| Forks | -------- | -------- | -------- | -------- | -------- | 1 | -------- |
| Hoes | -------- | -------- | -------- | -------- | 203 | 19 | -------- |

## *Fisheries of New Jersey, 1938*—Continued

### CATCH: BY COUNTIES

| Species | Atlantic | | Bergen | | Burlington | | Camden | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 100 | $1 | ------- | ------- | ------- | ------- | ------- | ------- |
| Bluefish | 6, 100 | 327 | ------- | ------- | ------- | ------- | ------- | ------- |
| Bonito | 500 | 40 | ------- | ------- | ------- | ------- | ------- | ------- |
| Butterfish | 281, 100 | 8, 417 | ------- | ------- | ------- | ------- | ------- | ------- |
| Carp | ------- | ------- | ------- | ------- | 39, 200 | $2, 504 | 20, 600 | $1, 648 |
| Catfish and bullheads | 15, 500 | 465 | ------- | ------- | 4, 600 | 205 | 10, 000 | 200 |
| Cod | 286, 100 | 9, 278 | ------- | ------- | ------- | ------- | ------- | ------- |
| Croaker | 124, 900 | 2, 076 | ------- | ------- | ------- | ------- | ------- | ------- |
| Drum: | | | | | | | | |
| Black | 100 | 1 | ------- | ------- | ------- | ------- | ------- | ------- |
| Red, or redfish | 100 | 1 | ------- | ------- | ------- | ------- | ------- | ------- |
| Eels: | | | | | | | | |
| Common | 11, 600 | 1, 581 | ------- | ------- | 500 | 41 | ------- | ------- |
| Conger | 3, 600 | 36 | ------- | ------- | ------- | ------- | ------- | ------- |
| Flounders: | | | | | | | | |
| Yellowtail and dabs | 40, 700 | 712 | ------- | ------- | ------- | ------- | ------- | ------- |
| Blackback | 4, 000 | 257 | ------- | ------- | ------- | ------- | ------- | ------- |
| Fluke | 419, 600 | 32, 794 | ------- | ------- | ------- | ------- | ------- | ------- |
| Grayfish | 200 | 3 | ------- | ------- | ------- | ------- | ------- | ------- |
| Hake | 12, 200 | 262 | ------- | ------- | ------- | ------- | ------- | ------- |
| Herring, sea | 2, 000 | 20 | ------- | ------- | ------- | ------- | ------- | ------- |
| Hickory shad | 100 | 1 | ------- | ------- | ------- | ------- | ------- | ------- |
| King whiting or "kingfish" | 5, 700 | 185 | ------- | ------- | ------- | ------- | ------- | ------- |
| Mackerel | 21, 300 | 772 | ------- | ------- | ------- | ------- | ------- | ------- |
| Menhaden | 409, 100 | 1, 533 | ------- | ------- | ------- | ------- | ------- | ------- |
| Mullet | 200 | 2 | ------- | ------- | ------- | ------- | ------- | ------- |
| Pollock | 400 | 6 | ------- | ------- | ------- | ------- | ------- | ------- |
| Scup | 185, 400 | 4, 861 | ------- | ------- | ------- | ------- | ------- | ------- |
| Sea bass | 110, 200 | 5, 242 | ------- | ------- | ------- | ------- | ------- | ------- |
| Sea robin | 2, 500 | 35 | ------- | ------- | ------- | ------- | ------- | ------- |
| Shad | 10, 300 | 1, 322 | 783, 900 | $60, 185 | 1, 800 | 332 | 30, 600 | 4, 080 |
| Skates | 5, 600 | 55 | ------- | ------- | ------- | ------- | ------- | ------- |
| Spot | 1, 700 | 18 | ------- | ------- | ------- | ------- | ------- | ------- |
| Squeteagues or "sea trout," gray | 124, 100 | 2, 314 | ------- | ------- | ------- | ------- | ------- | ------- |
| Squirrel hake | 9, 100 | 99 | ------- | ------- | ------- | ------- | ------- | ------- |
| Striped bass | 47, 300 | 4, 913 | ------- | ------- | 24, 000 | 2, 880 | ------- | ------- |
| Sturgeon | 300 | 31 | ------- | ------- | ------- | ------- | ------- | ------- |
| Suckers | 1, 100 | 110 | ------- | ------- | 1, 500 | 117 | 400 | 16 |
| Tautog | 1, 600 | 32 | ------- | ------- | ------- | ------- | ------- | ------- |
| White perch | 9, 800 | 1, 022 | ------- | ------- | 1, 000 | 95 | ------- | ------- |
| Whiting | 18, 700 | 286 | ------- | ------- | ------- | ------- | ------- | ------- |
| Crabs: | | | | | | | | |
| Hard | 19, 200 | 670 | 6, 700 | 168 | ------- | ------- | ------- | ------- |
| Soft and peelers | 8, 000 | 1, 082 | ------- | ------- | ------- | ------- | ------- | ------- |
| Lobsters | 15, 100 | 2, 838 | ------- | ------- | ------- | ------- | ------- | ------- |
| Clams: | | | | | | | | |
| Hard, public | 251, 000 | 30, 773 | ------- | ------- | 6, 700 | 891 | ------- | ------- |
| Hard, private | 61, 800 | 7, 985 | ------- | ------- | 15, 300 | 2, 854 | ------- | ------- |
| Soft, public | 222, 700 | 18, 643 | ------- | ------- | ------- | ------- | ------- | ------- |
| Surf or skimmer | 6, 500 | 250 | ------- | ------- | ------- | ------- | ------- | ------- |
| Oysters, market: | | | | | | | | |
| Public, fall | 1, 800 | 375 | ------- | ------- | ------- | ------- | ------- | ------- |
| Private, spring | 64, 000 | 14, 329 | ------- | ------- | 14, 800 | 1, 850 | ------- | ------- |
| Private, fall | 66, 500 | 15, 087 | ------- | ------- | 55, 400 | 8, 832 | ------- | ------- |
| Scallops, sea | 113, 900 | 8, 769 | ------- | ------- | ------- | ------- | ------- | ------- |
| Squid | 35, 000 | 563 | ------- | ------- | ------- | ------- | ------- | ------- |
| Turtles: | | | | | | | | |
| Green | 100 | 1 | ------- | ------- | ------- | ------- | ------- | ------- |
| Snapper | 1, 400 | 112 | ------- | ------- | ------- | ------- | ------- | ------- |
| Total | 3, 039, 900 | 180, 587 | 790, 600 | 60, 353 | 164, 800 | 20, 601 | 61, 600 | 5, 944 |

## *Fisheries of New Jersey, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Cape May | | Cumberland | | Gloucester | | Hudson | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | -------- | -------- | 8,000 | $120 | -------- | -------- | -------- | -------- |
| Amberjack | 800 | $16 | -------- | -------- | -------- | -------- | -------- | -------- |
| Bluefish | 456,100 | 34,402 | -------- | -------- | -------- | -------- | -------- | -------- |
| Bonito | 39,700 | 1,574 | -------- | -------- | -------- | -------- | -------- | -------- |
| Butterfish | 1,141,300 | 44,075 | -------- | -------- | -------- | -------- | -------- | -------- |
| Carp | -------- | -------- | 45,500 | 2,051 | 65,800 | $6,580 | -------- | -------- |
| Catfish and bullheads | 400 | 12 | 5,600 | 305 | 37,200 | 1,590 | -------- | -------- |
| Cod | 1,221,600 | 44,509 | -------- | -------- | -------- | -------- | -------- | -------- |
| Croaker | 3,814,400 | 46,203 | 1,000 | 30 | -------- | -------- | -------- | -------- |
| Drum: | | | | | | | | |
| Black | 600 | 6 | -------- | -------- | -------- | -------- | -------- | -------- |
| Red or redfish | 5,100 | 51 | -------- | -------- | -------- | -------- | -------- | -------- |
| Eels: | | | | | | | | |
| Common | 22,300 | 3,447 | 5,400 | 568 | 100 | 15 | -------- | -------- |
| Conger | 17,200 | 216 | -------- | -------- | -------- | -------- | -------- | -------- |
| Flounders: | | | | | | | | |
| Gray sole | 1,900 | 37 | -------- | -------- | -------- | -------- | -------- | -------- |
| Lemon sole | 26,600 | 1,548 | -------- | -------- | -------- | -------- | -------- | -------- |
| Yellowtail and dabs | 246,600 | 3,831 | -------- | -------- | -------- | -------- | -------- | -------- |
| Blackback | 17,900 | 868 | -------- | -------- | -------- | -------- | 72,000 | $2,160 |
| Fluke | 1,335,000 | 106,997 | -------- | -------- | -------- | -------- | -------- | -------- |
| Frigate mackerel | 1,400 | 18 | -------- | -------- | -------- | -------- | -------- | -------- |
| Grayfish | 700 | 7 | -------- | -------- | -------- | -------- | -------- | -------- |
| Groupers | 12,600 | 370 | -------- | -------- | -------- | -------- | -------- | -------- |
| Haddock | 1,500 | 14 | -------- | -------- | -------- | -------- | -------- | -------- |
| Hake | 24,900 | 511 | -------- | -------- | -------- | -------- | -------- | -------- |
| Herring, sea | 29,900 | 300 | -------- | -------- | -------- | -------- | -------- | -------- |
| Hickory shad | 500 | 5 | -------- | -------- | -------- | -------- | -------- | -------- |
| Kingfish or "king mackerel" | 100,000 | 3,000 | -------- | -------- | -------- | -------- | -------- | -------- |
| King whiting or "kingfish" | 46,600 | 1,995 | -------- | -------- | -------- | -------- | -------- | -------- |
| Mackerel | 414,700 | 19,700 | -------- | -------- | -------- | -------- | -------- | -------- |
| Menhaden | 5,629,300 | 21,747 | -------- | -------- | -------- | -------- | -------- | -------- |
| Pollock | 200 | 4 | -------- | -------- | -------- | -------- | -------- | -------- |
| Sand perch | 100 | 2 | -------- | -------- | -------- | -------- | -------- | -------- |
| Scup | 2,684,500 | 35,185 | -------- | -------- | -------- | -------- | -------- | -------- |
| Sea bass | 1,093,300 | 67,788 | -------- | -------- | -------- | -------- | -------- | -------- |
| Sea robin | 16,500 | 177 | -------- | -------- | -------- | -------- | -------- | -------- |
| Shad | 13,500 | 934 | 165,000 | 18,613 | 7,700 | 1,220 | -------- | -------- |
| Sharks | 15,000 | 134 | -------- | -------- | -------- | -------- | -------- | -------- |
| Skates | 25,000 | 156 | -------- | -------- | -------- | -------- | -------- | -------- |
| Snapper, red | 28,200 | 1,808 | -------- | -------- | -------- | -------- | -------- | -------- |
| Spanish mackerel | 1,900 | 121 | -------- | -------- | -------- | -------- | -------- | -------- |
| Spot | 40,700 | 826 | 17,000 | 340 | -------- | -------- | -------- | -------- |
| Squeteagues or "sea trout," gray | 2,687,300 | 59,577 | 11,300 | 382 | -------- | -------- | -------- | -------- |
| Squirrel hake | 3,600 | 36 | -------- | -------- | -------- | -------- | -------- | -------- |
| Striped bass | 10,700 | 1,660 | 4,200 | 630 | -------- | -------- | -------- | -------- |
| Sturgeon | 1,700 | 201 | -------- | -------- | -------- | -------- | -------- | -------- |
| Tautog | 7,800 | 137 | -------- | -------- | -------- | -------- | -------- | -------- |
| Tilefish | 100 | 4 | -------- | -------- | -------- | -------- | -------- | -------- |
| White perch | 2,100 | 212 | 3,000 | 309 | -------- | -------- | -------- | -------- |
| Whiting | 251,000 | 4,411 | -------- | -------- | -------- | -------- | 800 | 8 |
| Crabs: | | | | | | | | |
| Hard | 6,700 | 442 | 267,800 | 5,750 | -------- | -------- | -------- | -------- |
| King | 2,164,000 | 4,994 | 288,000 | 683 | -------- | -------- | -------- | -------- |
| Soft and peelers | 900 | 405 | -------- | -------- | -------- | -------- | -------- | -------- |
| Lobsters | 7,000 | 772 | -------- | -------- | -------- | -------- | -------- | -------- |
| Clams: | | | | | | | | |
| Hard, public | 282,300 | 42,154 | 12,100 | 1,828 | -------- | -------- | -------- | -------- |
| Hard, private | 2,700 | 324 | 13,100 | 1,378 | -------- | -------- | -------- | -------- |
| Surf or skimmer | 765,900 | 17,551 | -------- | -------- | -------- | -------- | -------- | -------- |
| Oysters, market: | | | | | | | | |
| Public, spring | 1,400 | 330 | -------- | -------- | -------- | -------- | -------- | -------- |
| Public, fall | 1,800 | 360 | 86,100 | 7,988 | -------- | -------- | -------- | -------- |
| Private, spring | 32,200 | 6,336 | 2,602,600 | 312,937 | -------- | -------- | -------- | -------- |
| Private, fall | 35,600 | 6,954 | 2,730,800 | 330,642 | -------- | -------- | -------- | -------- |
| Scallops, sea | 100 | 21 | -------- | -------- | -------- | -------- | -------- | -------- |
| Squid | 445,900 | 7,574 | -------- | -------- | -------- | -------- | -------- | -------- |
| Turtles: | | | | | | | | |
| Loggerhead | 100 | 1 | -------- | -------- | -------- | -------- | -------- | -------- |
| Snapper | -------- | -------- | 7,200 | 780 | 100 | 5 | -------- | -------- |
| Total | 25,239,400 | 597,050 | 6,273,700 | 685,334 | 110,900 | 9,410 | 72,800 | 2,168 |

### *Fisheries of New Jersey, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Hunterdon | | Mercer | | Middlesex | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | | | | | 45,200 | $2,696 |
| Carp | 2,700 | $216 | 13,000 | $520 | | |
| Catfish and bullheads | | | 2,000 | 100 | | |
| Eels, common | | | 3,000 | 240 | 4,600 | 268 |
| Mackerel | | | | | 200 | 8 |
| Shad | 45,600 | 4,398 | 11,000 | 1,262 | 4,900 | 887 |
| Squeteagues or "sea trout," gray | | | | | 73,500 | 3,138 |
| Suckers | 7,100 | 426 | 39,000 | 1,170 | | |
| Crabs, hard | | | | | 2,000 | 60 |
| Clams, hard, public | | | | | 17,200 | 1,960 |
| Oysters, market, public, fall | | | | | 14,200 | 1,421 |
| Total | 55,400 | 5,040 | 68,000 | 3,292 | 161,800 | 10,438 |

| Species | Monmouth | | Ocean | | Salem | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 320,000 | $28,117 | 210,900 | $15,836 | | |
| Bonito | 107,100 | 3,706 | 546,600 | 20,037 | | |
| Butterfish | 338,300 | 14,219 | 2,342,800 | 68,801 | | |
| Carp | | | | | 196,900 | $15,752 |
| Catfish and bullheads | | | | | 45,300 | 2,718 |
| Cod | 47,500 | 1,552 | 697,200 | 19,019 | | |
| Croaker | 150,600 | 2,630 | 1,668,100 | 18,419 | | |
| Drum, black | 200 | 2 | 600 | 12 | | |
| Eels: | | | | | | |
| Common | 62,100 | 6,115 | 8,300 | 706 | 11,400 | 960 |
| Conger | 1,600 | 16 | 4,100 | 41 | | |
| Flounders: | | | | | | |
| Yellowtail and dabs | 13,000 | 551 | 1,500 | 45 | | |
| Blackback | 47,100 | 1,260 | 40,400 | 1,730 | | |
| Fluke | 49,000 | 2,632 | 279,500 | 25,209 | | |
| Frigate mackerel | 14,400 | 144 | 45,200 | 452 | | |
| Goosefish | | | 2,500 | 25 | | |
| Grayfish | 21,400 | 210 | 79,600 | 796 | | |
| Hake | 300 | 3 | 3,700 | 44 | | |
| Herring, sea | 620,600 | 3,684 | 508,300 | 2,544 | | |
| Hickory shad | 12,000 | 120 | 14,400 | 72 | | |
| King whiting or "kingfish" | 16,400 | 740 | 33,800 | 1,227 | | |
| Launce | 100 | 3 | | | | |
| Mackerel | 292,300 | 15,821 | 1,407,900 | 46,832 | | |
| Menhaden | 41,697,800 | 140,051 | 364,800 | 915 | | |
| Pollock | 70,800 | 1,593 | 29,800 | 549 | | |
| Sand perch | 1,000 | 10 | | | | |
| Scup | 763,000 | 7,609 | 1,317,400 | 13,174 | | |
| Sea bass | 26,300 | 1,139 | 734,600 | 30,018 | | |
| Sea robin | 4,400 | 44 | 49,800 | 498 | | |
| Shad | 993,900 | 85,168 | 312,300 | 30,635 | 111,500 | 13,444 |
| Sharks | 9,500 | 92 | 105,700 | 1,686 | | |
| Silversides | 1,500 | 15 | | | | |
| Skates | 28,200 | 151 | 49,000 | 245 | | |
| Spanish mackerel | 2,800 | 280 | 4,700 | 394 | | |
| Spot | 64,300 | 1,522 | 59,900 | 721 | | |
| Squeteagues or "sea trout," gray | 1,168,200 | 37,578 | 2,224,300 | 53,816 | | |
| Squirrel hake | 23,700 | 239 | 125,300 | 1,253 | | |
| Striped bass | 2,800 | 372 | 57,300 | 6,865 | 700 | 105 |
| Sturgeon | 1,300 | 260 | 1,800 | 160 | | |
| Suckers | | | | | 1,100 | 66 |
| Swellfish | 1,500 | 15 | | | | |
| Tautog | 6,900 | 262 | 14,300 | 266 | | |
| Tuna | 76,000 | 2,272 | 31,500 | 1,004 | | |
| White perch | | | 1,000 | 135 | 2,600 | 182 |
| Whiting | 2,888,000 | 21,459 | 3,070,000 | 23,971 | | |
| Yellow perch | | | 2,500 | 250 | 700 | 56 |
| Crabs: | | | | | | |
| Hard | 690,800 | 23,304 | 105,300 | 1,107 | 14,800 | 925 |
| King | 8,000 | 30 | | | | |
| Soft and peelers | 293,300 | 97,565 | 11,400 | 3,590 | 6,000 | 1,125 |
| Lobsters | 247,600 | 33,118 | 57,200 | 10,850 | | |

*Fisheries of New Jersey, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Monmouth | | Ocean | | Salem | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams: | | | | | | |
| Hard, public | 1,270,500 | $164,930 | 870,900 | $105,974 | | |
| Hard, private | | | 121,300 | 14,995 | | |
| Soft, public | 550,000 | 29,205 | 102,000 | 6,575 | | |
| Surf or skimmer | | | 32,500 | 2,500 | | |
| Oysters, market: | | | | | | |
| Public, spring | 18,200 | 2,130 | 1,300 | 269 | | |
| Public, fall | 9,000 | 1,051 | 1,400 | 269 | | |
| Private, spring | | | 32,300 | 7,478 | | |
| Private, fall | | | 28,400 | 6,315 | | |
| Squid | 145,100 | 964 | 662,000 | 10,342 | | |
| Turtles: | | | | | | |
| Green | 3,800 | 38 | | | | |
| Loggerhead | 4,300 | 43 | 1,100 | 11 | | |
| Total | 53,186,500 | 734,034 | 18,478,500 | 558,677 | 391,000 | $35,333 |

## PENNSYLVANIA

*Fisheries of Pennsylvania, 1938* [1]

OPERATING UNITS: BY GEAR

| Item | Haul seines |
|---|---|
| | *Number* |
| Fishermen on boats and shore, casual | 31 |
| Boats, other than motor | 11 |
| Apparatus: | |
| Number | 10 |
| Length, yards | 1,705 |

CATCH: BY GEAR

| Species | Haul seines | |
|---|---|---|
| | *Pounds* | *Value* |
| Carp | 2,800 | $189 |
| Shad | 13,900 | 2,978 |
| Suckers | 23,100 | 1,127 |
| Total | 39,800 | 4,294 |

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[1] The commercial fisheries of Pennsylvania are confined to Bucks County.

## DELAWARE

*Fisheries of Delaware, 1938*

OPERATING UNITS: BY GEAR

| Item | Purse seines, menhaden | Haul seines | Gill nets | | | Lines | |
|---|---|---|---|---|---|---|---|
| | | | Drift | Run-around | Stake | Hand | Trawl |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 186 | | | | | | |
| On boats and shore: | | | | | | | |
| Regular | | 4 | | 4 | 1 | | |
| Casual | | 120 | 38 | 12 | 18 | 11 | 6 |
| Total | 186 | 124 | 38 | 16 | 19 | 11 | 6 |
| Vessels, steam | 6 | | | | | | |
| Net tonnage | 839 | | | | | | |
| Boats: | | | | | | | |
| Motor | | | 10 | 4 | 1 | 3 | 3 |
| Other | | 36 | 10 | 5 | 9 | 4 | |
| Accessory boats | | 6 | | | | | |
| Apparatus: | | | | | | | |
| Number | 6 | 36 | 25 | 8 | 18 | 11 | 3 |
| Length, yards | 3,666 | 8,350 | | | | | |
| Square yards | | | 44,540 | 3,760 | 9,337 | | |
| Hooks, baits, or snoods | | | | | | 22 | 8,400 |

## *Fisheries of Delaware, 1938*—Continued

### OPERATING UNITS: BY GEAR—Continued

| Item | Pound nets | Stop nets | Fyke nets | Dip nets | Pots | |
|---|---|---|---|---|---|---|
| | | | | | Eel | Lobster |
| Fishermen: | | | | | | |
| On boats and shore: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Regular | ---------- | ---------- | ---------- | 25 | 1 | ---------- |
| Casual | 4 | 3 | 25 | 39 | 9 | 4 |
| Total | 4 | 3 | 25 | 64 | 10 | 4 |
| Boats: | | | | | | |
| Motor | ---------- | ---------- | 3 | 6 | 1 | 2 |
| Other | 3 | 2 | 13 | 55 | 7 | ---------- |
| Apparatus: | | | | | | |
| Number | 13 | 7 | 206 | 64 | 271 | 98 |
| Square yards | ---------- | 1, 230 | ---------- | ---------- | ---------- | ---------- |

| Item | Dredges | | | Tongs, other than for oysters | By hand, other than for oysters | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| | Clam | Crab | Oyster | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 14 | 9 | 35 | ---------- | ---------- | 228 |
| On boats and shore: | | | | | | |
| Regular | ---------- | ---------- | ---------- | ---------- | ---------- | 31 |
| Casual | ---------- | 2 | ---------- | 2 | 19 | 279 |
| Total | 14 | 11 | 35 | 2 | 19 | 538 |
| Vessels: | | | | | | |
| Steam | ---------- | ---------- | ---------- | ---------- | ---------- | 6 |
| Net tonnage | ---------- | ---------- | ---------- | ---------- | ---------- | 839 |
| Motor | 4 | 3 | 5 | ---------- | ---------- | 7 |
| Net tonnage | 84 | 49 | 103 | ---------- | ---------- | 136 |
| Total vessels | 4 | 3 | 5 | ---------- | ---------- | 13 |
| Total Net tonnage | 84 | 49 | 103 | ---------- | ---------- | 975 |
| Boats: | | | | | | |
| Motor | ---------- | 1 | ---------- | ---------- | ---------- | 25 |
| Other | ---------- | ---------- | ---------- | 2 | ---------- | 121 |
| Accessory boats | ---------- | ---------- | ---------- | ---------- | ---------- | 6 |
| Apparatus: | | | | | | |
| Number | 8 | 8 | 10 | 2 | ---------- | ---------- |
| Yards at mouth | 10 | 9 | 11 | ---------- | ---------- | ---------- |

### CATCH: BY GEAR

| Species | Purse seines | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Drift | | Runaround | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | ---------- | ---------- | 44, 300 | $887 | 1, 700 | $38 | ---------- | ---------- |
| Bluefish | ---------- | ---------- | 700 | 49 | 2, 300 | 161 | ---------- | ---------- |
| Carp | ---------- | ---------- | 16, 200 | 1, 296 | ---------- | ---------- | ---------- | ---------- |
| Catfish and bullheads | ---------- | ---------- | 13, 300 | 403 | ---------- | ---------- | ---------- | ---------- |
| Croaker | ---------- | ---------- | 162, 400 | 1, 727 | 53, 200 | 798 | ---------- | ---------- |
| Gizzard shad | ---------- | ---------- | 100 | 3 | ---------- | ---------- | ---------- | ---------- |
| Menhaden | 16, 207, 000 | $72, 990 | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- |
| Mullet | ---------- | ---------- | 600 | 24 | 10, 100 | 404 | 74, 000 | $2, 960 |
| Shad | ---------- | ---------- | 1, 800 | 280 | 8, 800 | 1, 511 | ---------- | ---------- |
| Spot | ---------- | ---------- | ---------- | ---------- | 1, 900 | 57 | ---------- | ---------- |
| Squeteagues or "sea trout," gray | ---------- | ---------- | 172, 700 | 5, 375 | 18, 100 | 718 | ---------- | ---------- |
| Striped bass | ---------- | ---------- | 11, 100 | 1, 110 | 300 | 30 | 1, 000 | 100 |
| White perch | ---------- | ---------- | 9, 100 | 950 | 100 | 10 | 300 | 30 |
| Yellow perch | ---------- | ---------- | 400 | 16 | ---------- | ---------- | ---------- | ---------- |
| Total | 16, 207, 000 | 72, 990 | 432, 700 | 12, 120 | 96, 500 | 3, 727 | 75, 300 | 3, 090 |

## *Fisheries of Delaware, 1938*—Continued

### CATCH: By gear—Continued

| Species | Gill nets—Con. | | Lines | | | | Pound nets | |
|---|---|---|---|---|---|---|---|---|
| | Stake | | Hand | | Trawl | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | | | 1,300 | $26 |
| Carp | 14,400 | $1,152 | | | | | 200 | 16 |
| Catfish and bullheads | | | | | | | 1,600 | 48 |
| Cod | | | | | 57,300 | $1,732 | | |
| Croaker | | | 11,300 | $170 | | | | |
| Eels, common | | | | | | | 600 | 97 |
| Flounders, fluke | 400 | 40 | | | | | | |
| Gizzard shad | | | | | | | 300 | 9 |
| Shad | 3,800 | 594 | | | | | | |
| Spot | | | 200 | 6 | | | | |
| Squeteagues or "sea trout," gray | | | 5,700 | 225 | | | | |
| Striped bass | 8,200 | 820 | | | | | | |
| Tautog | | | 1,400 | 42 | | | | |
| White perch | 300 | 30 | | | | | 2,100 | 210 |
| Yellow perch | | | | | | | 2,500 | 117 |
| Total | 27,100 | 2,636 | 18,600 | 443 | 57,300 | 1,732 | 8,600 | 523 |

| Species | Stop nets | | Fyke nets | | Dip nets | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Carp | 5,000 | $396 | | | | |
| Catfish and bullheads | | | 10,200 | $306 | | |
| Croaker | | | 1,200 | 18 | | |
| Eels, common | | | 13,100 | 1,649 | | |
| Flounders, fluke | | | 2,700 | 168 | | |
| Squeteagues or "sea trout," gray | | | 1,100 | 88 | | |
| Striped bass | | | 4,300 | 430 | | |
| White perch | | | 5,500 | 550 | | |
| Yellow perch | | | 4,400 | 220 | | |
| Crabs: | | | | | | |
| Hard | | | 400 | 12 | 131,000 | $2,620 |
| Soft and peelers | | | | | 85,000 | 17,000 |
| Turtles, snapper | | | 3,600 | 284 | | |
| Total | 5,000 | 396 | 46,500 | 3,725 | 216,000 | 19,620 |

| Species | Pots | | | | Dredges | | Tongs | | By hand | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Eel | | Lobster | | | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels, common | 13,500 | $2,153 | | | | | | | | |
| Crabs: | | | | | | | | | | |
| Hard | | | | | 52,400 | $1,953 | | | | |
| King | | | | | | | | | 81,200 | $163 |
| Lobsters | | | 3,100 | $927 | | | | | | |
| Clams: | | | | | | | | | | |
| Hard, public | | | | | 4,400 | 559 | | | | |
| Hard, private | | | | | 20,000 | 2,775 | | | | |
| Mussels, sea | | | | | | | 1,900 | $323 | | |
| Oysters, market, private, fall | | | | | 139,700 | 14,001 | | | | |
| Total | 13,500 | 2,153 | 3,100 | 927 | 216,500 | 19,288 | 1,900 | 323 | 81,200 | 163 |

### OPERATING UNITS: By counties

| Item | Kent | New Castle | Sussex |
|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* |
| On vessels | 42 | | 186 |
| On boats and shore: | | | |
| Regular | | 2 | 29 |
| Casual | 82 | 35 | 162 |
| Total | 124 | 37 | 377 |
| Vessels: | | | |
| Steam | | | 6 |
| Net tonnage | | | 839 |

## *Fisheries of Delaware, 1938*—Continued

### OPERATING UNITS: By counties—Continued

| Item | Kent | New Castle | Sussex |
|---|---|---|---|
| Vessels—Continued. | *Number* | *Number* | *Number* |
| Motor | 7 | | |
| Net tonnage | 136 | | |
| Total vessels | 7 | | 6 |
| Total net tonnage | 136 | | 839 |
| Boats: | | | |
| Motor | 3 | 3 | 19 |
| Other | 19 | 15 | 87 |
| Accessory boats | | | 6 |
| Apparatus: | | | |
| Purse seines, menhaden | | | 6 |
| Length, yards | | | 3,666 |
| Haul seines, common | 11 | 9 | 16 |
| Length, yards | 2,570 | 1,395 | 4,385 |
| Gill nets: | | | |
| Drift | 2 | 6 | 17 |
| Square yards | 1,220 | 25,100 | 18,220 |
| Runaround | | | 8 |
| Square yards | | | 3,760 |
| Stake | 6 | 3 | 9 |
| Square yards | 7,340 | 1,000 | 997 |
| Lines: | | | |
| Hand | | | 11 |
| Hooks | | | 22 |
| Trawl | | | 3 |
| Hooks | | | 8,400 |
| Pound nets | | 4 | 9 |
| Stop nets | 5 | 2 | |
| Square yards | 780 | 450 | |
| Fyke nets | 4 | 84 | 118 |
| Dip nets | | | 64 |
| Pots: | | | |
| Eel | 70 | 21 | 180 |
| Lobster | | | 98 |
| Dredges: | | | |
| Clam | 8 | | |
| Yards at mouth | 10 | | |
| Crab | 8 | | |
| Yards at mouth | 9 | | |
| Oyster | 10 | | |
| Yards at mouth | 11 | | |
| Tongs, other than for oysters | 2 | | |

### CATCH: By counties

| Species | Kent | | New Castle | | Sussex | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 1,700 | $38 | 45,600 | $913 |
| Bluefish | | | | | 3,000 | 210 |
| Carp | 8,500 | $676 | 27,300 | 2,184 | | |
| Catfish and bullheads | 2,300 | 69 | 22,400 | 672 | 400 | 16 |
| Cod | | | | | 57,300 | 1,732 |
| Croaker | 65,800 | 762 | | | 162,300 | 1,951 |
| Eels, common | 3,300 | 521 | 5,300 | 458 | 18,600 | 2,920 |
| Flounders, fluke | | | | | 3,100 | 208 |
| Gizzard shad | | | 400 | 12 | | |
| Menhaden | | | | | 16,207,000 | 72,990 |
| Mullet | | | | | 84,700 | 3,388 |
| Shad | 5,100 | 789 | 7,100 | 1,205 | 2,200 | 391 |
| Spot | | | | | 2,100 | 63 |
| Squeteagues or "sea trout," gray | 71,300 | 2,387 | | | 126,300 | 4,019 |
| Striped bass | 3,900 | 390 | | | 21,000 | 2,100 |
| Tautog | | | | | 1,400 | 42 |
| White perch | 3,800 | 380 | | | 13,600 | 1,400 |
| Yellow perch | | | 1,200 | 48 | 6,100 | 305 |
| Crabs: | | | | | | |
| Hard | 52,400 | 1,953 | 400 | 12 | 131,000 | 2,620 |
| King | 81,200 | 163 | | | | |
| Soft and peelers | | | | | 85,000 | 17,000 |
| Lobsters | | | | | 3,100 | 927 |
| Clams: | | | | | | |
| Hard, public | 4,400 | 559 | | | | |
| Hard, private | 20,000 | 2,775 | | | | |
| Mussels, sea | 1,900 | 323 | | | | |
| Oysters, market, private, fall | 139,700 | 14,001 | | | | |
| Turtles, snapper | | | 3,600 | 284 | | |
| Total | 463,600 | 25,748 | 69,400 | 4,913 | 16,973,800 | 113,195 |

## RECEIPTS OF FISHERY PRODUCTS AT NEW YORK CITY

Receipts of fresh and frozen fishery products (excluding imports arriving by steamship and entered at New York City) at the salt-water market in New York City during 1939 totaled 228,293,329 pounds, with the largest receipts amounting to 23,517,566 pounds in May, and the smallest amounting to 15,650,541 pounds in February. The State of New York (including direct landings at the market) was the largest contributor to these receipts, furnishing 90,721,867 pounds. Next in order were Massachusetts, New Jersey, Florida, and Connecticut. Imports of fishery commodities entered at New York City during 1939 aggregated 7,710,619 pounds. Important among the countries of origin of these commodities were Japan, Union of South Africa, Portugal, and Morocco. Tabular statements which include detailed data collected and compiled by the Division's Fishery Market News Service on the receipts of fishery commodities at New York City during 1939 are included in the following tables. There also is included a statement of the landings of fishery commodities by fishing craft.

*Receipts of fresh and frozen fishery products at the Salt-Water Market in New York City, 1939*

BY SPECIES AND MONTHS

| Species | January | February | March | April | May | June |
|---|---|---|---|---|---|---|
| SALT-WATER FISH | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Albacore | ----- | 200 | ----- | ----- | ----- | ----- |
| Alewives | 31, 205 | 7, 279 | 23, 711 | 62, 632 | 3, 985 | 2, 275 |
| Alewives, frozen | 128 | 434 | 2, 203 | ----- | ----- | ----- |
| Amberjack | 4, 380 | 1, 900 | 1, 000 | ----- | ----- | ----- |
| Anchovies, frozen | 150 | ----- | ----- | ----- | ----- | ----- |
| Bluefish | 495, 054 | 122, 367 | 157, 195 | 350, 821 | 96, 157 | 162, 363 |
| Bluefish, frozen | 3, 861 | 14, 850 | ----- | ----- | ----- | ----- |
| Blue runner | 400 | 200 | 560 | ----- | ----- | ----- |
| Bonito | ----- | ----- | ----- | ----- | 515 | 21, 497 |
| Bonito, frozen | ----- | ----- | 300 | ----- | ----- | ----- |
| Butterfish | 593, 813 | 86, 555 | 884, 905 | 1, 030, 159 | 829, 694 | 1, 371, 608 |
| Butterfish, frozen | 33, 018 | 23, 194 | 7, 731 | ----- | ----- | ----- |
| Cod: | | | | | | |
| Large | 83, 610 | 269, 896 | 571, 295 | 210, 905 | 36, 525 | 52, 845 |
| Market | 581, 491 | 598, 957 | 622, 410 | 555, 930 | 509, 037 | 543, 036 |
| Steak | 872, 366 | 1, 184, 156 | 1, 176, 567 | 1, 116, 866 | 1, 157, 729 | 1, 056, 000 |
| Crevalle (jacks) | ----- | 2, 200 | 660 | 90 | ----- | ----- |
| Croaker | 85, 600 | 44, 900 | 217, 510 | 211, 020 | 322, 253 | 438, 510 |
| Croaker, frozen | 25, 506 | ----- | 100 | ----- | ----- | ----- |
| Cunner (bergall) | 525 | 85 | 1, 137 | 239 | 805 | 1, 292 |
| Cusk | 2, 665 | 165 | 475 | 285 | 335 | 185 |
| Dabs, sea | 2, 175 | ----- | ----- | 23, 750 | 8, 525 | 2, 788 |
| Dogfish | 14, 865 | 739 | 540 | 2, 467 | 3, 926 | 3, 461 |
| Drum: | | | | | | |
| Black | ----- | ----- | ----- | 100 | ----- | ----- |
| Red (channel bass) | 5, 484 | ----- | 139 | ----- | 700 | ----- |
| Eels: | | | | | | |
| Common | 32, 097 | 21, 343 | 50, 941 | 51, 864 | 57, 327 | 97, 926 |
| Common, frozen | 150 | 560 | 125 | ----- | ----- | ----- |
| Conger (sea) | 18, 166 | 7, 395 | 20, 866 | 3, 705 | 2, 267 | ----- |
| Eel pout (conger eel) | 3, 032 | 1, 379 | 3, 250 | 1, 010 | 67 | 425 |
| Flounders | 626, 046 | 428, 700 | 966, 208 | 1, 562, 171 | 3, 148, 254 | 2, 104, 710 |
| Flounders, frozen | 700 | 630 | ----- | ----- | ----- | ----- |
| Fluke | 177, 415 | 315, 257 | 360, 251 | 141, 011 | 336, 950 | 658, 833 |
| Garfish | ----- | ----- | 166 | 231 | 25 | 130 |
| Goatfish (salmonete) | 25 | 305 | 268 | ----- | ----- | ----- |
| Goosefish (bellyfish) | 1, 989 | 2, 986 | 4, 105 | 4, 001 | 1, 903 | 970 |
| Groupers | 1, 842 | 460 | 1, 398 | ----- | 308 | ----- |
| Haddock | 975, 482 | 661, 842 | 1, 116, 636 | 1, 524, 422 | 1, 991, 790 | 1, 634, 520 |
| Hake | 163, 542 | 75, 658 | 63, 879 | 108, 392 | 124, 512 | 234, 643 |
| Halibut | 13, 034 | 50, 065 | 73, 841 | 494, 488 | 791, 717 | 616, 105 |
| Halibut, frozen | 276, 376 | 348, 811 | 327, 416 | 58, 100 | 28, 000 | 10, 050 |
| Herring, sea (sardine) | 45, 425 | 26, 970 | 141, 557 | 86, 035 | 85, 170 | 101, 050 |
| Herring, sea (sardine) frozen | 6, 650 | ----- | 4, 980 | ----- | ----- | ----- |
| Hickory shad | 10, 357 | 4, 620 | 13, 468 | 8, 725 | 200 | ----- |
| Jewfish (warsaw) | 9, 689 | 6, 279 | 5, 866 | 6, 097 | 5, 617 | 1, 350 |

NOTE.—Weights shown are for fishery products as received.

*Receipts of fresh and frozen fishery products at the Salt-Water Market in New York City, 1939*—Continued

BY SPECIES AND MONTHS—Continued

| Species | January | February | March | April | May | June |
|---|---|---|---|---|---|---|
| SALT-WATER FISH—continued | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| John Dory | ----- | ----- | 1, 205 | 10 | ----- | ----- |
| Kingfish (king mackerel) | 230, 343 | 265, 283 | 263, 182 | 7, 766 | 10 | ----- |
| King whiting (kingfish) | 46, 664 | 14, 655 | 11, 183 | 26, 534 | 38, 608 | 12, 046 |
| Launce (sand eel) | 900 | 1, 525 | 60 | 410 | 3, 560 | 5, 400 |
| Mackerel | 252, 752 | 26, 467 | 30, 400 | 491, 314 | 2, 106, 544 | 1, 472, 620 |
| Mackerel, frozen | 231, 186 | 327, 742 | 349, 481 | 115, 723 | ----- | ----- |
| Menhaden (bunker) | ----- | ----- | 60 | 150 | ----- | 100 |
| Mojarra (muttonfish) | 1, 184 | 6, 616 | 2, 854 | 1, 665 | 410 | ----- |
| Mullet | 40, 208 | 13, 571 | 1, 750 | 9, 620 | 1, 900 | 1, 875 |
| Mullet, frozen | ----- | 3, 500 | ----- | ----- | ----- | ----- |
| Permit | 2, 040 | 255 | 2, 296 | ----- | ----- | ----- |
| Pollock | 289, 030 | 97, 939 | 132, 323 | 127, 743 | 117, 556 | 92, 202 |
| Pollock, frozen | ----- | 2, 981 | ----- | ----- | ----- | ----- |
| Pompano | 13, 359 | 606 | 5, 518 | 6, 788 | 1, 439 | 1, 208 |
| Pompano, frozen | ----- | 3, 109 | 1, 314 | ----- | ----- | ----- |
| Rosefish | 12, 290 | 2, 470 | 5, 970 | 450 | ----- | ----- |
| Sablefish, frozen | 8, 000 | ----- | 25, 000 | 15, 000 | 22, 000 | 8, 000 |
| Salmon: | | | | | | |
| Atlantic | 80 | ----- | ----- | ----- | 400 | 16, 814 |
| Atlantic, frozen | 1, 000 | ----- | ----- | 1, 000 | 105 | ----- |
| Chinook (king) | ----- | 1, 560 | 3, 425 | 41, 292 | 233, 254 | 277, 593 |
| Chinook (king), frozen | 3, 500 | 28, 000 | 11, 000 | 10, 900 | ----- | 13, 200 |
| Chum (fall), frozen | 7, 000 | 13, 277 | 13, 050 | 10, 000 | ----- | ----- |
| Silver | ----- | ----- | ----- | ----- | 3, 375 | 14, 000 |
| Silver, frozen | 63, 000 | 167, 675 | 202, 400 | 116, 400 | 19, 300 | 35, 000 |
| Scup (porgy) | 484, 832 | 554, 475 | 949, 279 | 1, 327, 779 | 987, 538 | 1, 046, 782 |
| Scup (porgy) frozen | 31, 852 | 28, 215 | 10, 029 | 100 | ----- | ----- |
| Sea bass | 183, 892 | 166, 200 | 362, 046 | 127, 625 | 272, 710 | 400, 030 |
| Sea robin | 4, 337 | 14, 120 | 10, 860 | 9, 565 | 13, 545 | 6, 434 |
| Sea trout (weakfish): | | | | | | |
| Gray | 27, 496 | 5, 156 | 11, 442 | 88, 580 | 384, 845 | 273, 367 |
| Gray, frozen | 34, 085 | 32, 077 | 22, 188 | ----- | ----- | ----- |
| Spotted | 55, 775 | 29, 782 | 41, 589 | 27, 275 | 13, 424 | 33 |
| Spotted, frozen | ----- | ----- | 500 | ----- | ----- | ----- |
| Shad | 16, 895 | 87, 548 | 264, 760 | 1, 968, 128 | 1, 364, 300 | 73, 520 |
| Shad, frozen | 74, 614 | 6, 800 | ----- | ----- | ----- | ----- |
| Sharks | 3, 355 | ----- | ----- | 920 | 2, 309 | 6, 345 |
| Sheepshead | 2, 243 | 1, 610 | 2, 811 | 25 | 340 | 200 |
| Silversides (spearing) | 23, 615 | 180 | 3, 280 | 15, 920 | 5, 190 | 1, 570 |
| Skate wings | 17, 084 | 12, 055 | 26, 382 | 19, 162 | 6, 879 | 5, 658 |
| Skate wings, frozen | ----- | 600 | 1, 300 | ----- | ----- | ----- |
| Smelt | 157, 805 | 71, 318 | 144, 149 | 187, 482 | 3, 405 | 790 |
| Smelt, frozen | 834, 866 | 671, 255 | 223, 160 | 14, 400 | 8, 200 | ----- |
| Snapper: | | | | | | |
| Mangrove | ----- | ----- | ----- | ----- | 101 | ----- |
| Red | 11, 373 | 8, 135 | 18, 625 | 19, 561 | 54, 183 | 2, 975 |
| Sole, gray | 287, 143 | 161, 539 | 302, 064 | 310, 800 | 293, 257 | 232, 987 |
| Spanish mackerel | 452, 309 | 133, 513 | 56, 376 | 42, 189 | 1, 126 | 1, 015 |
| Spanish mackerel, frozen | ----- | 691 | 446 | 2, 050 | 1, 080 | ----- |
| Spot | 400 | 2, 100 | 400 | 1, 170 | 7, 735 | 6, 648 |
| Spot, frozen | ----- | 10, 500 | ----- | ----- | ----- | ----- |
| Steelhead trout | 16, 997 | 11, 040 | 11, 497 | 1, 600 | ----- | ----- |
| Steelhead trout, frozen | ----- | 3, 000 | ----- | ----- | ----- | ----- |
| Striped bass | 121, 236 | 189, 752 | 305, 219 | 318, 951 | 105, 119 | 24, 874 |
| Striped bass, frozen | ----- | ----- | 377 | ----- | ----- | ----- |
| Sturgeon | 2, 005 | 446 | 6, 030 | 2, 699 | 4, 339 | 1, 772 |
| Swellfish (blowfish) | ----- | ----- | ----- | 24 | 1, 460 | 112 |
| Swordfish | ----- | ----- | ----- | ----- | ----- | 11, 306 |
| Tautog (blackfish) | 1, 854 | ----- | ----- | 294 | 15, 797 | 3, 405 |
| Tilefish | 104, 832 | 97, 699 | 141, 186 | 150, 580 | 161, 898 | 142, 145 |
| Tomcod | 2, 390 | ----- | ----- | ----- | ----- | ----- |
| Tuna | ----- | ----- | ----- | ----- | ----- | 3, 825 |
| Tuna, frozen | ----- | 700 | 620 | ----- | ----- | ----- |
| Whitebait | 3, 525 | 1, 994 | 1, 326 | 1, 510 | 8, 215 | 1, 620 |
| White perch | 12, 366 | 21, 477 | 69, 646 | 59, 942 | 3, 532 | 1, 377 |
| Whiting | 779, 323 | 191, 180 | 276, 128 | 342, 967 | 758, 740 | 734, 402 |
| Whiting, frozen | 15, 081 | 130, 037 | 72, 316 | 12, 233 | 10, 000 | ----- |
| Wolffish (catfish) | 2, 435 | 605 | 1, 455 | 420 | 255 | 1, 405 |
| Yellowtail (dabs) | 2, 237, 442 | 2, 473, 766 | 2, 119, 704 | 1, 114, 249 | 455, 780 | 381, 203 |
| Fillets, unclassified | 16, 200 | 165, 670 | 257, 630 | 199, 300 | 179, 185 | 185, 675 |
| Fillets, unclassified, frozen | 145, 920 | 61, 635 | 118, 632 | 32, 200 | 60, 116 | 16, 700 |
| Roe | 8, 839 | 16, 662 | 9, 252 | 8, 117 | 4, 551 | 932 |
| Tongues and cheeks | 92 | 850 | 50 | ----- | 150 | ----- |
| Unclassified | 31, 307 | 35, 784 | 39, 035 | 47, 499 | 161, 544 | 148, 916 |
| Total | 12, 606, 664 | 10, 688, 734 | 13, 767, 919 | 15, 053, 627 | 17, 443, 608 | 14, 784, 653 |

*Receipts of fresh and frozen fishery products at the Salt-Water Market in New York City, 1939*—Continued

BY SPECIES AND MONTHS—Continued

| Species | January | February | March | April | May | June |
|---|---|---|---|---|---|---|
| FRESH-WATER FISH | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Brook trout | 2, 330 | 2, 885 | 2, 898 | 3, 942 | 5, 781 | 7, 955 |
| Carp | 17, 175 | 16, 914 | 35, 072 | 30, 437 | 6, 387 | 1, 437 |
| Catfish and bullheads | 13, 592 | 14, 054 | 10, 342 | 14, 052 | 12, 402 | 900 |
| Crappie | 2, 469 | 3, 205 | 153 | 100 | ---------- | ---------- |
| Pickerel (jacks) | 639 | 640 | 531 | 333 | ---------- | ---------- |
| Rock bass | ---------- | ---------- | ---------- | ---------- | 210 | 240 |
| Sucker "mullet" | 300 | 216 | 50 | 400 | ---------- | ---------- |
| Sunfish | 200 | ---------- | 200 | 50 | 200 | 140 |
| Yellow perch | 2, 821 | 4, 381 | 7, 580 | 845 | 770 | ---------- |
| Unclassified | 305 | 151 | ---------- | ---------- | 50 | 48 |
| Total | 39, 831 | 42, 446 | 56, 826 | 50, 159 | 25, 800 | 10, 720 |
| SHELLFISH, ETC. | | | | | | |
| Clams: | | | | | | |
| Hard | 1, 999, 200 | 2, 093, 760 | 2, 100, 400 | 1, 846, 640 | 2, 104, 320 | 2, 178, 960 |
| Razor | 105 | 840 | 1, 155 | 105 | ---------- | ---------- |
| Soft | 136, 845 | 159, 435 | 180, 180 | 152, 235 | 138, 375 | 191, 655 |
| Soft, shucked | ---------- | 42 | 42 | ---------- | ---------- | ---------- |
| Conchs | 17, 040 | 17, 480 | 45, 800 | 49, 920 | 56, 720 | 73, 280 |
| Crabs: | | | | | | |
| Hard | 106, 575 | 111, 090 | 99, 925 | 102, 431 | 56, 815 | 170, 565 |
| King | ---------- | ---------- | ---------- | ---------- | 1, 500 | 30 |
| Oyster | 344 | 368 | 165 | 76 | ---------- | ---------- |
| Soft | ---------- | ---------- | 16, 521 | 70, 047 | 407, 955 | 377, 664 |
| Crab meat | 47, 027 | 41, 779 | 49, 205 | 59, 230 | 64, 681 | 112, 633 |
| Frogs | ---------- | ---------- | ---------- | 262 | 309 | 18 |
| Frog legs | 4, 950 | 6, 741 | 6, 168 | 2, 365 | 7, 828 | 9, 388 |
| Frog legs, frozen | ---------- | ---------- | 190 | ---------- | ---------- | ---------- |
| Lobsters: | | | | | | |
| Common | 255, 548 | 235, 430 | 201, 980 | 205, 792 | 369, 041 | 488, 946 |
| Spiny | 149 | 119 | 227 | 200 | 150 | ---------- |
| Lobster meat: | | | | | | |
| Common | 628 | 10 | 162 | 908 | 4, 868 | 2, 499 |
| Common, frozen | 984 | 1, 174 | ---------- | ---------- | ---------- | ---------- |
| Spiny | 631 | 429 | 1, 154 | ---------- | 785 | 775 |
| Mussels | 85, 195 | 131, 010 | 211, 255 | 222, 915 | 219, 945 | 204, 930 |
| Octopus | 3, 294 | 496 | 531 | 77 | 210 | ---------- |
| Oysters, shell | 1, 072, 650 | 1, 001, 625 | 1, 106, 550 | 864, 000 | 46, 425 | ---------- |
| Oysters, shucked | 126, 905 | 141, 347 | 153, 306 | 96, 373 | 2, 108 | ---------- |
| Periwinkles | 5, 940 | 5, 220 | 6, 180 | 7, 500 | 5, 520 | 9, 318 |
| Scallops: | | | | | | |
| Bay | 22, 673 | 17, 771 | 12, 138 | 3, 320 | 624 | 512 |
| Bay, frozen | 180 | 1, 953 | 6, 162 | 3, 150 | ---------- | ---------- |
| Sea | 262, 017 | 154, 575 | 313, 641 | 241, 434 | 393, 228 | 428, 652 |
| Sea, frozen | 5, 076 | 1, 188 | 2, 250 | 1, 800 | 270 | ---------- |
| Sea urchins (sea eggs) | 10, 950 | 6, 400 | 6, 725 | 2, 725 | ---------- | ---------- |
| Shrimp | 1, 194, 370 | 643, 945 | 723, 909 | 810, 531 | 1, 363, 127 | 1, 411, 131 |
| Shrimp, frozen | ---------- | 32, 715 | 61, 569 | 65, 010 | 40, 000 | 200 |
| Squid | 51, 092 | 52, 520 | 135, 220 | 263, 669 | 761, 342 | 662, 809 |
| Squid, frozen | 37, 263 | 58, 934 | 48, 120 | 1, 100 | ---------- | ---------- |
| Terrapin | 637 | 565 | 736 | 685 | 162 | 55 |
| Turtles: | | | | | | |
| Loggerhead | ---------- | ---------- | ---------- | ---------- | ---------- | 465 |
| Snapping | 640 | 400 | 290 | 420 | 1, 850 | 510 |
| Total | 5, 448, 908 | 4, 919, 361 | 5, 491, 856 | 5, 074, 920 | 6, 048, 158 | 6, 324, 995 |
| Grand total | 18, 095, 403 | 15, 650, 541 | 19, 316, 601 | 20, 178, 706 | 23, 517, 566 | 21, 120, 368 |

| Species | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|
| SALT-WATER FISH | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Albacore | ---------- | 9, 428 | 40, 658 | 10, 604 | ---------- | ---------- | 60, 890 |
| Alewives | 1, 916 | 3, 870 | 9, 409 | 14, 403 | 8, 730 | 22, 956 | 192, 371 |
| Alewives, frozen | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 2, 765 |
| Amberjack | ---------- | ---------- | ---------- | 100 | ---------- | 200 | 7, 580 |
| Anchovies | 2, 320 | 7, 945 | 7, 275 | 4, 155 | ---------- | ---------- | 21, 695 |
| Anchovies, frozen | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 150 |
| Bluefish | 145, 164 | 298, 547 | 338, 564 | 298, 117 | 92, 193 | 646, 410 | 3, 202, 952 |
| Bluefish, frozen | 1, 800 | ---------- | ---------- | ---------- | ---------- | ---------- | 20, 511 |
| Blue runner | ---------- | 75 | ---------- | ---------- | ---------- | ---------- | 1, 235 |
| Bonito | 9, 775 | 47, 323 | 21, 531 | 15, 042 | 188 | ---------- | 115, 871 |

*Receipts of fresh and frozen fishery products at the Salt-Water Market in New York City, 1939*—Continued

BY SPECIES AND MONTHS—Continued

| Species | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|
| SALT-WATER FISH—continued | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Bonito, frozen | --- | --- | --- | --- | 932 | --- | 1,232 |
| Butterfish | 909,795 | 1,151,595 | 949,017 | 559,998 | 284,190 | 595,094 | 9,246,423 |
| Butterfish, frozen | --- | --- | 167 | 6,949 | 28,923 | 19,318 | 119,300 |
| Cod: | | | | | | | |
| Large | 83,305 | 32,075 | 62,865 | 50,015 | 58,374 | 71,904 | 1,583,614 |
| Market | 583,486 | 570,327 | 621,881 | 738,202 | 892,794 | 690,990 | 7,508,541 |
| Steak | 744,445 | 819,875 | 587,901 | 670,166 | 943,743 | 763,842 | 11,093,656 |
| Crevalle (jacks) | --- | --- | --- | --- | --- | --- | 2,950 |
| Croaker | 436,054 | 302,261 | 188,910 | 244,896 | 210,385 | 162,775 | 2,865,074 |
| Croaker, frozen | --- | 8,251 | 15,753 | 10,111 | 20,137 | 20,895 | 100,753 |
| Cunner (bergall) | 2,055 | 360 | 1,218 | 2,108 | 1,864 | 1,143 | 12,831 |
| Cusk | 120 | 325 | 270 | 1,070 | 155 | --- | 6,050 |
| Dabs, sea | 2,785 | 1,160 | 4,900 | 2,665 | 1,965 | 1,310 | 52,023 |
| Dogfish | 2,464 | 1,610 | 1,883 | 4,579 | 24,280 | 12,647 | 73,461 |
| Dolphin | --- | 100 | --- | --- | --- | --- | 100 |
| Drum: | | | | | | | |
| Black | 200 | --- | 2,510 | 400 | --- | --- | 3,210 |
| Red (channel bass) | --- | --- | --- | 1,980 | 550 | 4,341 | 13,194 |
| Eels: | | | | | | | |
| Common | 66,302 | 53,852 | 85,934 | 90,942 | 57,240 | 228,317 | 894,085 |
| Common, frozen | --- | --- | --- | 25,850 | 25,000 | 5,225 | 56,910 |
| Conger (sea) | --- | --- | 305 | 805 | 3,298 | 1,235 | 58,042 |
| Eel pout (conger eel) | 150 | --- | --- | --- | 40 | 1,596 | 10,949 |
| Flounders | 1,372,611 | 1,098,850 | 1,089,719 | 1,968,993 | 1,503,400 | 751,561 | 16,621,223 |
| Flounders, frozen | --- | --- | --- | --- | 2,000 | 3,102 | 6,432 |
| Fluke | 514,170 | 529,870 | 302,006 | 80,443 | 27,853 | 138,351 | 3,582,410 |
| Garfish | 115 | 403 | 47 | 1,042 | 568 | --- | 2,727 |
| Goatfish (salmonete) | --- | --- | --- | --- | --- | --- | 598 |
| Goosefish (bellyfish) | 420 | --- | --- | 635 | 2,088 | 3,018 | 22,115 |
| Groupers | 1,000 | 200 | --- | --- | --- | 1,000 | 6,208 |
| Haddock | 1,562,195 | 1,378,859 | 1,381,844 | 871,641 | 917,968 | 955,428 | 14,972,627 |
| Hake | 194,801 | 237,328 | 335,747 | 372,155 | 297,098 | 76,347 | 2,284,102 |
| Halibut | 709,899 | 549,179 | 550,221 | 654,649 | 100,477 | 3,639 | 4,607,314 |
| Halibut, frozen | 23,000 | 15,100 | 85,794 | 146,390 | 263,759 | 176,009 | 1,758,805 |
| Harvestfish (angelfish) | --- | --- | --- | 4,100 | --- | --- | 4,100 |
| Herring, sea (sardine) | 56,375 | 77,025 | 96,900 | 50,625 | 106,890 | 140,048 | 1,014,070 |
| Herring, sea (sardine), frozen | --- | --- | --- | --- | 50,025 | 10,737 | 72,392 |
| Hickory shad | --- | 186 | --- | 13,105 | 5,677 | 8,636 | 64,974 |
| Jack, yellow | --- | --- | 10,372 | 458 | --- | --- | 10,830 |
| Jewfish (warsaw) | 846 | 605 | 2,092 | 1,055 | 1,041 | 7,110 | 47,647 |
| John Dory | --- | --- | --- | --- | --- | --- | 1,215 |
| Kingfish (king mackerel) | --- | 100 | --- | 940 | 2,986 | 212,316 | 982,926 |
| King whiting (kingfish) | 7,209 | 4,917 | 10,923 | 11,904 | 37,655 | 56,099 | 278,397 |
| Launce (sand eel) | 1,780 | 625 | 3,930 | 11,680 | 28,760 | 10,085 | 68,745 |
| Mackerel | 1,126,835 | 1,274,963 | 1,319,859 | 907,660 | 733,725 | 416,221 | 10,159,360 |
| Mackerel, frozen | 2,460 | 55,000 | 12,068 | 57,552 | 99,502 | 104,146 | 1,354,860 |
| Menhaden (bunker) | --- | 1,435 | 1,530 | 1,247 | --- | --- | 4,522 |
| Mojarra (muttonfish) | --- | --- | --- | --- | 500 | 120 | 13,349 |
| Mullet | 15,760 | 51,913 | 95,456 | 110,547 | 118,380 | 55,178 | 516,158 |
| Mullet, frozen | --- | --- | --- | --- | --- | --- | 3,500 |
| Permit | --- | --- | --- | --- | 460 | 2,643 | 7,694 |
| Pilotfish | --- | --- | 2,836 | 225 | --- | --- | 3,061 |
| Pollock | 91,853 | 112,201 | 198,283 | 247,739 | 350,313 | 245,574 | 2,102,756 |
| Pollock, frozen | --- | --- | --- | --- | --- | --- | 2,981 |
| Pompano | 2,744 | 4,154 | 6,892 | 10,780 | 4,186 | 6,930 | 64,604 |
| Pompano, frozen | 100 | --- | --- | --- | --- | --- | 4,523 |
| Rosefish | --- | --- | 40 | 95 | 250 | 550 | 22,115 |
| Sablefish, frozen | --- | --- | 38,124 | 25,000 | 27,000 | 3,049 | 171,173 |
| Salmon: | | | | | | | |
| Atlantic | 5,268 | 1,056 | 880 | --- | --- | --- | 24,498 |
| Atlantic, frozen | --- | --- | 10,000 | --- | --- | --- | 12,105 |
| Chinook (king) | 245,880 | 185,904 | 79,295 | 57,400 | 1,400 | 4,860 | 1,131,863 |
| Chinook (king), frozen | 2,000 | 15,700 | 38,000 | 17,601 | 7,000 | 24,907 | 171,808 |
| Chum (fall) | --- | --- | 240 | 15,500 | 3,400 | --- | 19,140 |
| Chum (fall), frozen | --- | 15,000 | --- | --- | 3,050 | --- | 61,377 |
| Pink (humpback) | --- | --- | 5,340 | --- | --- | --- | 5,340 |
| Red (sockeye), frozen | --- | --- | --- | --- | --- | 2,054 | 2,054 |
| Silver | 145,725 | 133,750 | 209,941 | 228,565 | 67,600 | --- | 802,956 |
| Silver, frozen | --- | 7,000 | 31,186 | 40,792 | 76,700 | 69,500 | 828,953 |
| Scup (porgy) | 1,049,393 | 799,329 | 476,180 | 730,055 | 301,520 | 362,295 | 9,069,457 |
| Scup (porgy), frozen | --- | 1,488 | 6,786 | 11,743 | 35,463 | 13,793 | 139,469 |
| Sea bass | 249,794 | 119,962 | 151,184 | 133,741 | 142,794 | 105,377 | 2,415,355 |
| Sea bass, frozen | --- | --- | 4,343 | 7,405 | 9,638 | 7,960 | 29,346 |
| Sea robin | 8,115 | 7,167 | 5,823 | 23,018 | 9,495 | 7,083 | 119,562 |
| Sea trout (weakfish): | | | | | | | |
| Gray | 286,274 | 283,931 | 429,481 | 475,077 | 197,061 | 26,905 | 2,489,615 |
| Gray, frozen | --- | 1,610 | 4,781 | 1,110 | 13,093 | 7,776 | 116,720 |
| Spotted | 60 | 2,546 | 4,146 | 56,305 | 98,040 | 127,282 | 456,257 |
| Spotted, frozen | --- | --- | --- | --- | --- | --- | 500 |

*Receipts of fresh and frozen fishery products at the Salt-Water Market in New York City, 1939*—Continued

BY SPECIES AND MONTHS—Continued

| Species | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|
| SALT-WATER FISH—continued | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Shad | 718 | 20 | 360 | 3, 210 | 5, 050 | 6, 754 | 3, 791, 263 |
| Shad, frozen |  |  | 90, 000 |  |  | 67, 539 | 238, 953 |
| Sharks | 5, 209 | 10, 579 | 2, 791 | 7, 119 | 8, 564 | 4, 072 | 51, 263 |
| Sheepshead | 100 |  | 470 | 1, 726 | 2, 693 | 2, 266 | 14, 484 |
| Silversides (spearing) | 540 | 7, 830 | 21, 280 | 33, 050 | 40, 190 | 57, 555 | 210, 200 |
| Skate wings | 4, 463 | 3, 531 | 6, 834 | 8, 911 | 32, 192 | 22, 524 | 165, 675 |
| Skate wings, frozen |  |  |  |  |  |  | 1, 900 |
| Smelt |  |  | 15, 611 | 67, 972 | 123, 653 | 182, 004 | 954, 189 |
| Smelt, frozen |  | 175 | 3, 225 | 119, 775 | 224, 577 | 325, 535 | 2, 425, 168 |
| Smelt, sea |  |  | 1, 000 | 450 |  |  | 1, 450 |
| Snapper: |  |  |  |  |  |  |  |
| Mangrove |  |  |  |  |  |  | 104 |
| Red | 4, 065 | 1, 844 | 2, 736 | 1, 185 | 4, 515 | 70, 930 | 200, 127 |
| Sole, gray | 201, 393 | 186, 983 | 171, 532 | 136, 367 | 101, 414 | 98, 525 | 2, 484, 004 |
| Spanish mackerel | 200 | 100 | 1, 828 | 15, 241 | 32, 063 | 269, 956 | 1, 005, 916 |
| Spanish mackerel, frozen | 1, 316 |  | 1, 069 |  |  |  | 6, 652 |
| Spot | 38, 312 | 82, 676 | 114, 665 | 173, 487 | 34, 005 | 1, 100 | 462, 698 |
| Spot, frozen |  |  |  |  |  | 3, 995 | 14, 495 |
| Steelhead trout | 300 |  | 4, 400 |  |  | 12, 259 | 58, 093 |
| Steelhead trout, frozen |  |  |  |  |  |  | 3, 000 |
| Striped bass | 25, 742 | 63, 019 | 28, 779 | 178, 789 | 143, 795 | 102, 999 | 1, 608, 274 |
| Striped bass, frozen |  |  |  |  |  |  | 377 |
| Sturgeon | 1, 345 | 1, 290 | 566 | 1, 681 | 2, 485 | 935 | 25, 593 |
| Swellfish (blowfish) |  |  |  | 250 | 25 |  | 1, 871 |
| Swordfish | 47, 254 | 143, 376 | 85, 424 | 5, 098 |  |  | 292, 458 |
| Swordfish, frozen |  |  |  |  | 181 |  | 181 |
| Tautog (blackfish) | 1, 057 | 259 | 3, 881 | 20, 544 | 17, 295 | 15, 484 | 79, 870 |
| Thimble-eyed mackerel | 25, 925 | 21, 365 | 11, 194 | 41, 780 | 2, 650 |  | 102, 914 |
| Tilefish | 4, 550 | 20, 070 | 630 | 19, 760 | 52, 445 | 61, 170 | 956, 965 |
| Tomcod |  |  |  |  | 100 | 2, 960 | 5, 450 |
| Tuna | 129, 505 | 127, 766 | 75, 169 | 8, 962 |  |  | 345, 227 |
| Tuna, frozen |  |  |  |  |  |  | 1, 320 |
| Whitebait | 80 | 200 | 5, 535 | 4, 145 | 13, 511 | 8, 708 | 50, 369 |
| White perch | 100 |  | 908 | 3, 574 | 14, 576 | 13, 552 | 201, 050 |
| Whiting | 626, 333 | 662, 009 | 596, 437 | 691, 758 | 1, 084, 213 | 709, 967 | 7, 453, 457 |
| Whiting, frozen |  |  |  | 3, 403 |  | 4, 286 | 247, 356 |
| Wolffish (catfish) |  | 120 | 40 | 55 |  | 105 | 6, 895 |
| Yellowtail (dabs) | 607, 710 | 963, 642 | 1, 158, 274 | 1, 460, 193 | 1, 551, 791 | 1, 927, 080 | 16, 450, 834 |
| Fillets, unclassified | 96, 730 | 122, 350 | 107, 980 | 93, 340 | 212, 033 | 87, 833 | 1, 724, 226 |
| Fillets, unclassified, frozen | 2, 700 | 10, 150 | 17, 100 | 39, 300 | 5, 130 | 2, 540 | 512, 123 |
| Roe | 90 |  | 25 | 4, 060 | 25, 169 | 2, 283 | 79, 983 |
| Tongues and cheeks |  |  |  |  | 100 | 190 | 1, 432 |
| Unclassified | 90, 178 | 102, 683 | 117, 496 | 122, 507 | 81, 579 | 53, 371 | 1, 031, 899 |
| Total | 12, 584, 733 | 12, 808, 672 | 12, 590, 479 | 13, 369, 821 | 12, 119, 790 | 11, 516, 364 | 159, 335, 064 |
| FRESH-WATER FISH |  |  |  |  |  |  |  |
| Brook trout | 5, 864 | 9, 068 | 7, 240 | 6, 783 | 3, 915 | 4, 043 | 62, 704 |
| Carp | 1, 558 | 500 | 9, 299 | 6, 834 | 17, 106 | 10, 201 | 152, 920 |
| Catfish and bullheads |  |  | 4, 105 | 14, 293 | 12, 554 | 10, 857 | 107, 151 |
| Crappie |  |  |  | 3, 700 | 6, 090 | 4, 042 | 19, 759 |
| Lake herring |  |  |  |  | 1, 050 |  | 1, 050 |
| Pickerel (jacks) |  |  |  |  | 126 | 12 | 2, 281 |
| Rock bass |  |  |  |  |  |  | 450 |
| Sucker "mullet" |  |  |  |  |  |  | 966 |
| Sunfish | 95 |  |  | 1, 100 | 3, 330 | 540 | 5, 855 |
| Yellow perch |  |  |  | 431 | 2, 544 | 2, 790 | 22, 162 |
| Unclassified |  |  |  | 400 | 125 |  | 1, 079 |
| Total | 7, 517 | 9, 568 | 20, 644 | 33, 541 | 46, 840 | 32, 485 | 376, 377 |
| SHELLFISH, ETC. |  |  |  |  |  |  |  |
| Clams: |  |  |  |  |  |  |  |
| Hard | 1, 984, 720 | 2, 061, 040 | 1, 964, 160 | 1, 923, 600 | 1, 713, 920 | 1, 618, 320 | 23, 589, 040 |
| Razor |  |  |  | 140 |  | 1, 190 | 3, 535 |
| Soft | 104, 715 | 101, 340 | 83, 610 | 103, 185 | 114, 930 | 143, 010 | 1, 609, 515 |
| Soft, shucked | 42 |  | 128 | 357 | 6, 579 | 8, 288 | 15, 478 |
| Surf |  |  |  |  |  | 180 | 180 |
| Conchs | 82, 800 | 77, 520 | 92, 400 | 88, 400 | 54, 640 | 52, 400 | 708, 400 |
| Crabs: |  |  |  |  |  |  |  |
| Hard | 150, 705 | 183, 755 | 377, 415 | 301, 785 | 130, 705 | 105, 875 | 1, 897, 641 |
| King |  |  |  |  |  |  | 1, 530 |
| Oyster |  |  | 112 | 292 | 630 | 184 | 2, 171 |
| Rock |  |  |  |  |  | 210 | 210 |
| Soft | 309, 381 | 312, 375 | 183, 567 | 26, 772 | 207 |  | 1, 704, 489 |
| Soft, frozen | 60 |  |  |  |  |  | 60 |

*Receipts of fresh and frozen fishery products at the Salt-Water Market in New York City, 1939*—Continued

BY SPECIES AND MONTHS—Continued

| Species | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|
| SHELLFISH, ETC.—continued | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Crab meat | 89, 691 | 104, 055 | 70, 186 | 71, 644 | 52, 868 | 50, 799 | 813, 798 |
| Frogs |  | 9 |  |  |  |  | 598 |
| Frog legs | 12, 673 | 11, 274 | 11, 971 | 13, 860 | 13, 002 | 5, 894 | 106, 114 |
| Frog legs, frozen |  |  |  |  |  |  | 190 |
| Lobsters: |  |  |  |  |  |  |  |
| Common | 445, 976 | 454, 679 | 396, 327 | 359, 649 | 295, 752 | 306, 495 | 4, 015, 615 |
| Spiny | 125 |  |  | 50 |  | 2, 529 | 3, 549 |
| Spiny, frozen |  |  |  |  |  | 200 | 200 |
| Lobster meat: |  |  |  |  |  |  |  |
| Common | 5, 244 | 15, 560 | 6, 731 | 7, 148 | 67 | 199 | 44, 024 |
| Common, frozen | 708 |  |  |  |  | 600 | 3, 466 |
| Spiny | 2, 385 | 1, 974 | 490 | 3, 681 | 3, 197 | 6, 575 | 22, 076 |
| Mussels | 134, 200 | 112, 860 | 143, 385 | 156, 365 | 122, 375 | 125, 895 | 1, 870, 330 |
| Octopus |  |  |  | 205 | 446 | 488 | 5, 747 |
| Oysters, shell |  | 11, 625 | 990, 450 | 1, 205, 925 | 1, 236, 675 | 1, 247, 400 | 8, 783, 325 |
| Oysters, shucked |  | 85 | 112, 948 | 149, 294 | 144, 644 | 154, 198 | 1, 081, 208 |
| Periwinkles | 3, 435 | 2, 150 | 2, 175 | 5, 979 | 5, 989 | 3, 113 | 62, 519 |
| Scallops: |  |  |  |  |  |  |  |
| Bay | 4, 832 | 3, 493 | 11, 264 | 26, 942 | 21, 102 | 18, 268 | 142, 939 |
| Bay, frozen |  |  |  |  |  |  | 11, 445 |
| Sea | 547, 542 | 572, 454 | 414, 495 | 430, 965 | 299, 421 | 326, 052 | 4, 384, 476 |
| Sea, frozen |  |  |  |  |  |  | 10, 584 |
| Sea urchins (sea eggs) |  |  | 175 | 3, 650 | 2, 800 | 11, 250 | 44, 675 |
| Shrimp | 1, 272, 557 | 1, 263, 727 | 1, 506, 380 | 1, 852, 475 | 1, 424, 670 | 1, 088, 239 | 14, 555, 061 |
| Shrimp, frozen |  |  |  |  |  | 1, 600 | 201, 094 |
| Snails |  |  |  |  | 1, 350 | 1, 550 | 2, 900 |
| Squid | 213, 804 | 124, 289 | 48, 796 | 128, 509 | 62, 052 | 12, 067 | 2, 516, 169 |
| Squid, frozen |  | 4, 303 | 44, 835 | 20, 026 | 39, 770 | 92, 986 | 347, 337 |
| Terrapin | 30 | 15 | 220 | 252 | 2, 862 | 756 | 6, 975 |
| Turtles: |  |  |  |  |  |  |  |
| Green |  | 1, 910 | 1, 200 | 1, 500 |  |  | 4, 610 |
| Hawksbill |  |  | 480 | 400 |  |  | 880 |
| Loggerhead | 280 | 150 | 340 | 60 |  |  | 1, 295 |
| Snapping | 350 | 40 | 230 | 330 | 540 | 840 | 6, 440 |
| Total | 5, 366, 255 | 5, 420, 682 | 6, 464, 470 | 6, 883, 440 | 5, 751, 193 | 5, 387, 650 | 68, 581, 888 |
| Grand total | 17, 958, 505 | 18, 238, 922 | 19, 075, 593 | 20, 286, 802 | 17, 917, 823 | 16, 936, 499 | 228, 293, 329 |

BY ORIGIN AND MONTHS

| Origin | January | February | March | April | May | June |
|---|---|---|---|---|---|---|
| DOMESTIC | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Alabama | 2, 175 | 1, 400 |  | 180 | 1, 650 |  |
| California |  | 47, 044 | 89, 674 | 34, 000 | 11, 625 |  |
| Connecticut | 421, 957 | 399, 283 | 530, 096 | 481, 971 | 600, 682 | 859, 847 |
| Delaware | 6, 778 | 6, 657 | 5, 345 | 10, 710 | 1, 208 | 4, 007 |
| District of Columbia |  |  | 1, 100 | 3, 400 | 350 |  |
| Florida | 2, 316, 981 | 996, 746 | 774, 649 | 575, 594 | 332, 205 | 125, 704 |
| Georgia | 31, 684 | 49, 235 | 32, 404 | 136, 684 | 330, 247 | 422, 359 |
| Illinois |  |  |  | 5, 600 |  |  |
| Louisiana | 196, 262 | 251, 065 | 411, 519 | 405, 384 | 445, 262 | 410, 014 |
| Maine | 317, 921 | 139, 652 | 424, 735 | 427, 965 | 394, 957 | 571, 048 |
| Maryland | 172, 462 | 282, 173 | 379, 783 | 604, 854 | 863, 958 | 807, 253 |
| Massachusetts | 3, 987, 388 | 3, 661, 846 | 4, 660, 044 | 3, 956, 359 | 4, 947, 425 | 4, 900, 624 |
| Michigan |  | 35 | 23, 710 | 890 | 400 |  |
| Mississippi |  | 6, 408 | 41, 775 | 1, 510 | 550 | 400 |
| New Jersey | 1, 092, 232 | 1, 154, 232 | 579, 655 | 1, 816, 725 | 2, 818, 161 | 1, 260, 737 |
| New York | 6, 646, 922 | 5, 941, 658 | 8, 859, 414 | 9, 190, 299 | 9, 901, 823 | 9, 451, 081 |
| North Carolina | 441, 075 | 433, 239 | 549, 779 | 471, 941 | 90, 850 | 73, 565 |
| Oregon | 7, 475 | 56, 135 | 4, 300 |  |  |  |
| Pennsylvania | 8, 731 | 905 | 10, 399 | 13, 842 | 6, 228 | 4, 920 |
| Rhode Island | 284, 880 | 142, 395 | 149, 311 | 158, 715 | 719, 101 | 482, 295 |
| South Carolina | 27, 992 | 11, 405 | 14, 413 | 37, 788 | 359, 606 | 492, 810 |
| Texas |  | 6, 000 | 40, 000 | 55, 000 | 51, 750 | 9, 375 |
| Vermont | 2, 205 | 3, 060 | 2, 571 | 1, 048 | 1, 234 | 1, 022 |
| Virginia | 663, 894 | 723, 002 | 712, 760 | 887, 245 | 494, 820 | 244, 045 |
| Washington | 189, 898 | 127, 513 | 182, 022 | 277, 897 | 431, 836 | 423, 567 |
| Wisconsin | 7, 271 | 33, 259 | 111, 934 | 183, 480 | 130 | 790 |
| Alaska |  | 80, 000 | 61, 000 |  | 28, 100 | 6, 400 |
| Total | 16, 826, 183 | 14, 554, 347 | 18, 652, 392 | 19, 739, 081 | 22, 834, 158 | 20, 551, 863 |

*Receipts of fresh and frozen fishery products at the Salt-Water Market in New York City, 1939*—Continued

BY ORIGIN AND MONTHS—Continued

| Origin | January | February | March | April | May | June |
|---|---|---|---|---|---|---|
| IMPORTED[1] | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| British Columbia[2] | 177, 500 | 309, 715 | 343, 466 | 401, 642 | 598, 180 | 540, 437 |
| New Brunswick | 824, 299 | 588, 137 | 188, 275 | 37, 123 | 3, 320 | 5, 290 |
| Nova Scotia | 120, 891 | 91, 457 | 87, 547 |  | 76, 005 | 12, 326 |
| Ontario |  |  |  |  | 275 |  |
| Prince Edward Island | 83, 255 | 38, 165 | 41, 275 | 60 |  | 818 |
| Quebec | 36, 900 | 68, 120 | 3, 535 | 800 | 1, 808 | 8, 758 |
| Canada (unclassified) | 25, 040 | 450 |  |  | 176 |  |
| Newfoundland | 1, 335 | 150 | 111 |  | 3, 644 | 876 |
| Total | 1, 269, 220 | 1, 096, 194 | 664, 209 | 439, 625 | 683, 408 | 568, 505 |
| Grand total | 18, 095, 403 | 15, 650, 541 | 19, 316, 601 | 20, 178, 706 | 23, 517, 566 | 21, 120, 368 |

| Origin | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|
| DOMESTIC | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Alabama | 3, 915 |  | 2, 586 | 4, 300 | 7, 958 | 24, 095 | 48, 259 |
| California | 32, 775 |  |  |  |  | 3, 700 | 218, 818 |
| Connecticut | 588, 333 | 440, 900 | 435, 925 | 529, 956 | 663, 139 | 744, 816 | 6, 696, 905 |
| Delaware | 3, 055 | 756 | 1, 960 | 6, 362 | 11, 157 | 8, 464 | 66, 459 |
| District of Columbia |  |  | 600 | 780 | 1, 415 | 3, 200 | 10, 845 |
| Florida | 189, 172 | 330, 201 | 240, 242 | 393, 470 | 531, 845 | 1, 985, 666 | 8, 792, 475 |
| Georgia | 332, 793 | 174, 033 | 215, 015 | 266, 573 | 116, 801 | 67, 448 | 2, 175, 276 |
| Illinois |  |  |  | 5, 030 | 11, 576 |  | 22, 206 |
| Louisiana | 611, 264 | 570, 171 | 500, 257 | 263, 061 | 181, 339 | 195, 192 | 4, 440, 790 |
| Maine | 462, 925 | 480, 722 | 386, 279 | 360, 023 | 275, 083 | 232, 114 | 4, 473, 424 |
| Maryland | 617, 960 | 621, 629 | 489, 780 | 372, 570 | 163, 400 | 59, 702 | 5, 435, 524 |
| Massachusetts | 4, 600, 142 | 5, 393, 684 | 5, 456, 477 | 6, 051, 862 | 5, 500, 606 | 4, 265, 033 | 57, 381, 490 |
| Michigan |  |  |  |  |  |  | 25, 035 |
| Mississippi | 200 | 11, 500 | 950 |  |  | 340 | 63, 633 |
| New Hampshire |  |  |  |  | 59 |  | 59 |
| New Jersey | 1, 213, 265 | 1, 506, 413 | 1, 672, 531 | 1, 499, 154 | 1, 259, 208 | 948, 818 | 16, 821, 131 |
| New York | 7, 499, 949 | 6, 979, 042 | 7, 204, 892 | 6, 849, 869 | 6, 245, 049 | 5, 951, 869 | 90, 721, 867 |
| North Carolina | 59, 081 | 209, 408 | 610, 652 | 1, 049, 107 | 1, 141, 694 | 740, 516 | 5, 870, 907 |
| Oregon | 11, 300 |  | 66, 900 | 121, 110 | 15, 000 | 9, 900 | 292, 120 |
| Pennsylvania | 2, 195 | 2, 220 | 10, 660 | 4, 720 | 2, 965 | 3, 715 | 71, 500 |
| Rhode Island | 154, 025 | 174, 557 | 241, 547 | 516, 762 | 320, 344 | 165, 831 | 3, 509, 763 |
| South Carolina | 197, 394 | 201, 305 | 247, 332 | 472, 169 | 59, 449 | 22, 204 | 2, 143, 867 |
| Texas | 11, 250 |  |  |  | 21, 250 |  | 194, 625 |
| Vermont | 29 | 20 | 9 | 135 | 161 | 60 | 11, 554 |
| Virginia | 237, 088 | 115, 749 | 162, 785 | 221, 187 | 434, 990 | 568, 994 | 5, 466, 559 |
| Washington | 399, 406 | 453, 494 | 295, 823 | 603, 554 | 226, 173 | 208, 954 | 3, 820, 137 |
| Wisconsin |  |  |  | 26, 818 | 44, 782 | 38, 189 | 446, 653 |
| Alaska | 92, 200 | 7, 700 |  | 25, 000 | 47, 705 | 37, 158 | 385, 263 |
| Total | 17, 319, 716 | 17, 673, 504 | 18, 243, 202 | 19, 643, 572 | 17, 283, 148 | 16, 285, 978 | 219, 607, 144 |
| IMPORTED[1] |  |  |  |  |  |  |  |
| British Columbia[2] | 585, 600 | 462, 795 | 673, 945 | 429, 992 | 259, 234 | 32, 926 | 4, 815, 432 |
| New Brunswick | 3, 366 | 12, 632 | 79, 352 | 41, 454 | 144, 067 | 307, 780 | 2, 235, 095 |
| Nova Scotia | 46, 095 | 89, 151 | 37, 612 | 38, 656 | 37, 594 | 52, 262 | 689, 596 |
| Ontario |  |  |  |  |  | 270 | 545 |
| Prince Edward Island |  |  |  | 61, 055 | 135, 617 | 235, 842 | 596, 087 |
| Quebec | 2, 492 | 440 | 41, 346 | 70, 338 | 40, 228 | 20, 941 | 295, 706 |
| Canada (unclassified) | 1, 236 |  |  |  |  |  | 26, 902 |
| Newfoundland |  | 400 | 136 | 1, 735 | 17, 935 | 500 | 26, 822 |
| Total | 638, 789 | 565, 418 | 832, 391 | 643, 230 | 634, 675 | 650, 521 | 8, 686, 185 |
| Grand total | 17, 958, 505 | 18, 238, 922 | 19, 075, 593 | 20, 286, 802 | 17, 917, 823 | 16, 936, 499 | 228, 293, 329 |

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[1] Does not include imports arriving by steamship entered at New York City.

[2] Includes catch taken by United States vessels and shipped in bond through British Columbia ports to New York.

*Imports of fishery products entered at New York City, 1939, by species and origin*

| Species | Belgium | British West Indies | Canada | Costa Rica | Cuba | Denmark | France | Germany | Iceland |
|---|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Brook trout, frozen |  |  |  |  |  | 22,704 |  |  |  |
| Eels: |  |  |  |  |  |  |  |  |  |
| Frozen |  |  | 47,883 |  |  |  |  |  |  |
| Live |  |  | 140,000 |  |  |  |  |  |  |
| Halibut, frozen |  |  | 2,060 |  |  |  |  |  |  |
| Mackerel |  |  | 22,000 |  |  |  |  |  |  |
| Salmonete |  |  |  |  | 1,400 |  |  |  |  |
| Smelt, frozen |  |  | 8,050 |  |  |  |  |  |  |
| Sole, frozen | 112 |  |  |  |  |  |  |  |  |
| Sturgeon, frozen |  |  |  |  |  |  | 7,086 |  |  |
| Tuna |  |  | 2,075 |  |  |  |  |  |  |
| Fillets, frozen: |  |  |  |  |  |  |  |  |  |
| Cod |  |  | 20,000 |  |  |  |  |  | 4,420 |
| Haddock |  |  | 60,000 |  |  |  |  |  | 700 |
| Halibut |  |  | 10,250 |  |  |  |  |  |  |
| Unclassified | 1,000 |  |  |  |  |  |  |  | 7,500 |
| Steaks, frozen: |  |  |  |  |  |  |  |  |  |
| Halibut |  |  | 7,500 |  |  |  |  |  |  |
| Swordfish |  |  | 25,244 |  |  |  |  |  |  |
| Unclassified, frozen |  |  | 100 |  |  |  |  | 66 |  |
| Total | 1,112 |  | 345,162 |  | 1,400 | 22,704 | 7,086 | 66 | 12,620 |
| SHELLFISH, ETC. |  |  |  |  |  |  |  |  |  |
| Frog legs |  |  |  |  | 7,788 |  |  |  |  |
| Lobster, spiny |  |  |  |  | 21,632 |  |  |  |  |
| Lobster meat: |  |  |  |  |  |  |  |  |  |
| Common |  |  | 8,584 |  |  |  |  |  |  |
| Spiny |  |  |  |  | 2,150 |  |  |  |  |
| Snails |  |  |  |  |  |  | 1,440 |  |  |
| Turtles |  | 700 |  | 291,037 | 573 |  |  |  |  |
| Total |  | 700 | 8,584 | 291,037 | 32,143 |  | 1,440 |  |  |
| Grand total | 1,112 | 700 | 353,746 | 291,037 | 33,543 | 22,704 | 8,526 | 66 | 12,620 |

| Species | Italy | Jamaica | Japan | Mexico | Morocco | Netherlands | Newfoundland | Norway | Panama |
|---|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Herring, sea, frozen |  |  |  |  |  |  | 56,425 | 11,000 |  |
| Plaice, frozen |  |  |  |  |  | 300 |  |  |  |
| Smelt, frozen |  |  | 93,100 |  |  | 1,470 | 190,750 |  |  |
| Sole, frozen |  |  |  |  |  | 44,052 |  |  |  |
| Swordfish, frozen: |  |  |  |  |  |  |  |  |  |
| Round |  |  | 587,588 |  |  |  |  |  |  |
| Split |  |  | 1,806,298 |  |  |  |  |  |  |
| Turbot, frozen |  |  |  |  |  | 4,200 |  |  |  |
| Fillets, frozen: |  |  |  |  |  |  |  |  |  |
| Halibut |  |  | 12,500 |  |  |  | 100 |  |  |
| Unclassified |  |  |  |  |  |  |  | 9,000 |  |
| Steaks, frozen: |  |  |  |  |  |  |  |  |  |
| Halibut |  |  | 10,000 |  |  |  |  |  |  |
| Swordfish |  |  | 103,655 |  |  |  |  |  |  |
| Unclassified, frozen | 259 |  |  |  |  |  |  |  |  |
| Total | 259 |  | 2,613,141 |  |  | 50,022 | 247,275 | 20,000 |  |
| SHELLFISH, ETC. |  |  |  |  |  |  |  |  |  |
| Frog legs, frozen |  |  | 162,491 |  |  |  |  |  |  |
| Lobster tails, spiny, frozen | 1,822 |  |  |  |  |  |  |  |  |
| Scallops, frozen |  |  | 4,482 |  |  |  |  |  |  |
| Snails | 47,520 |  |  |  | 706,545 |  |  |  |  |
| Turtles |  | 154,500 |  | 72,849 |  |  |  |  | 7,500 |
| Pulpi, frozen | 10,000 |  | 4,301 | 20,551 |  |  |  |  |  |
| Sepia, frozen |  |  | 16,927 |  |  |  |  |  |  |
| Unclassified |  |  |  | 15,000 |  |  |  |  |  |
| Total | 59,342 | 154,500 | 188,201 | 108,400 | 706,545 |  |  |  | 7,500 |
| Grand total | 59,601 | 154,500 | 2,801,342 | 108,400 | 706,545 | 50,022 | 247,275 | 20,000 | 7,500 |

NOTE.—Includes only imports arriving by steamship entered at New York City.

*Imports of fishery products entered at New York City, 1939, by Species and Origin*—Continued

| Species | Peru | Portugal | Rumania | U.S.S.R. (Russia) | Spain | Tunisia | Union of South Africa | United Kingdom | Total |
|---|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Brook, trout, frozen | | | | | | | | | 22, 704 |
| Eels: | | | | | | | | | |
| Frozen | | | | | | | | | 47, 883 |
| Live | | | | | | | | | 140, 000 |
| Halibut, frozen | | | | | | | | | 2, 060 |
| Herring, sea, frozen | | 3, 000 | | | | | | | 70, 425 |
| Mackerel | | | | | | | | | 22, 000 |
| Plaice, frozen | | | | | | | | | 300 |
| Salmon, frozen | | | | 162, 697 | | | | | 162, 697 |
| Salmonete | | | | | | | | | 1, 400 |
| Sardine, frozen | | 14, 200 | | | | | | | 14, 200 |
| Smelt, frozen | | | | | | | | | 293, 370 |
| Sole, frozen | | | | | | | | 3, 400 | 47, 564 |
| Sprat, frozen | | 2, 000 | | | | | | | 2, 000 |
| Sturgeon, frozen | | | 30, 110 | 278, 800 | | | | | 315, 996 |
| Swordfish, frozen: | | | | | | | | | |
| Round | | | | | | | | | 587, 588 |
| Split | | | | | | | | | 1,806,298 |
| Tuna | | | | | | | | | 2, 075 |
| Turbot, frozen | | | | | | | | | 4, 200 |
| Fillets, frozen: | | | | | | | | | |
| Cod | | | | | | | | | 24, 420 |
| Haddock | | | | | | | | | 60, 700 |
| Halibut | | | | | | | | | 22, 850 |
| Unclassified | | | | | | | | | 17, 500 |
| Steaks, frozen: | | | | | | | | | |
| Halibut | | | | | | | | | 17, 500 |
| Swordfish | | | | | | | | | 128, 899 |
| Unclassified | | 5, 580 | | 89, 272 | | | | 3, 789 | 99, 066 |
| Total | | 24, 780 | 30, 110 | 530, 769 | | | | 7, 189 | 3,913,695 |
| SHELLFISH, ETC. | | | | | | | | | |
| Frog legs | | | | | | | | | 7, 788 |
| Frog legs, frozen | | | | | | | | | 162, 491 |
| Lobster, spiny | | | | | | | | | 21, 632 |
| Lobster tails, spiny, frozen | | | | | | | 1, 413, 300 | | 1,415,122 |
| Lobster meat: | | | | | | | | | |
| Common | | | | | | | | | 8, 584 |
| Spiny | | | | | | | | | 2, 150 |
| Scallops, frozen | | | | | | | | | 4, 482 |
| Snails | | | | | | 4, 425 | | | 759, 930 |
| Turtles | 8, 818 | | | | | | | | 535, 977 |
| Pulpi, frozen | | 447, 000 | | | 74, 500 | | | | 556, 352 |
| Pulpi and sepia, frozen | | 173, 030 | | | | | | | 173, 030 |
| Sepia, frozen | | 70, 930 | | | | | | | 87, 857 |
| Unclassified | | 46, 529 | | | | | | | 61, 529 |
| Total | 8, 818 | 737, 489 | | | 74, 500 | 4, 425 | 1, 413, 300 | | 3,796,924 |
| Grand total | 8, 818 | 762, 269 | 30, 110 | 530, 769 | 74, 500 | 4, 425 | 1, 413, 300 | 7, 189 | 7,710,619 |

*Landings by fishing craft at New York City, 1939*

BY SPECIES AND MONTHS

| Species | January | February | March | April | May | June |
|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Bluefish | 10 | | 1, 431 | 243 | 50 | |
| Butterfish | 556, 936 | 60, 105 | 884, 505 | 931, 045 | 110, 227 | 12, 620 |
| Cod: | | | | | | |
| Large | 83, 610 | 269, 896 | 571, 295 | 210, 905 | 36, 525 | 52, 845 |
| Market | 110, 365 | 153, 350 | 213, 240 | 185, 000 | 216, 030 | 342, 715 |
| Steak | 10, 740 | 13, 245 | 8, 515 | | 48, 555 | 112, 755 |
| Croaker | | | 19, 700 | | | 945 |
| Cunner (bergall) | | 85 | | | | 170 |
| Cusk | 2, 320 | | | 270 | | |
| Dabs, sea | 2, 175 | | | | | |
| Dogfish | 215 | 100 | | | | |

*Landings by fishing craft at New York City, 1939*—Continued

BY SPECIES AND MONTHS—Continued

| Species | January | February | March | April | May | June |
|---|---|---|---|---|---|---|
| FISH—continued | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Eels: | | | | | | |
| Common | 100 | | | | | |
| Conger (sea) | 16, 716 | 6, 955 | 18, 526 | 3, 705 | 2, 140 | |
| Eel pout (conger eel) | | | 1, 735 | | | |
| Flounders | 123, 695 | 106, 940 | 173, 421 | 160, 255 | 557, 799 | 329, 526 |
| Fluke | 157, 655 | 260, 115 | 353, 326 | 134, 117 | 49, 051 | 180 |
| Goosefish (bellyfish) | | 670 | 1, 690 | 1, 010 | | |
| Haddock | 727, 287 | 437, 400 | 808, 910 | 1, 381, 782 | 1, 901, 300 | 1, 514, 965 |
| Hake | 64, 011 | 14, 273 | 20, 492 | 33, 755 | 29, 180 | 12, 440 |
| Halibut | 1, 613 | 1, 546 | 3, 348 | 8, 682 | 11, 610 | 6, 258 |
| Herring, sea (sardine) | 40 | | 100 | 240 | | |
| John Dory | | | 1, 205 | 10 | | |
| Mackerel | 17, 262 | 26, 467 | 30, 245 | 273, 885 | 562, 944 | 18, 000 |
| Menhaden | | | 60 | | | |
| Pollock | 134, 130 | 11, 455 | 18, 280 | 47, 165 | 14, 680 | 14, 850 |
| Rosefish | 12, 290 | | | 410 | | |
| Scup (porgy) | 435, 498 | 454, 675 | 919, 688 | 1, 221, 130 | 214, 780 | 112, 370 |
| Sea bass | 81, 717 | 82, 749 | 303, 216 | 94, 180 | 15, 987 | 4, 025 |
| Sea robin | 2, 190 | 1, 710 | 5, 860 | 2, 410 | | |
| Sea trout, gray (weakfish) | 3, 719 | 3, 576 | 6, 872 | 7, 165 | 4, 006 | 2, 125 |
| Shad | | | 1, 130 | 71, 446 | 45, 022 | |
| Sharks | | | | 350 | 40 | |
| Skate wings | 3, 515 | 4, 455 | 6, 625 | 2, 500 | | |
| Sole, gray | 85, 670 | 1, 728 | 1, 515 | 5, 045 | 860 | 70 |
| Striped bass | | | | 6 | 20 | |
| Sturgeon | | | | 625 | 320 | |
| Tilefish | 73, 512 | 81, 494 | 76, 456 | 125, 130 | 159, 720 | 131, 195 |
| Whiting | 42, 670 | 35, 145 | 204, 188 | 158, 045 | 35, 078 | |
| Wolffish (catfish) | 2, 075 | 395 | 315 | 150 | | 620 |
| Yellowtail (dabs) | 491, 668 | 766, 560 | 355, 675 | 146, 105 | 64, 695 | 108, 880 |
| Roe | 623 | 3, 800 | 470 | | | |
| Unclassified | 406 | 800 | 1, 675 | 160 | | 20 |
| Total | 3, 244, 433 | 2, 802, 689 | 5, 013, 709 | 5, 206, 926 | 4, 080, 619 | 2, 777, 574 |
| SHELLFISH | | | | | | |
| Crabs: | | | | | | |
| Hard | 25, 760 | 16, 100 | 10, 850 | | | |
| King | | | | | 1, 500 | |
| Lobsters, common | 3, 463 | 2, 790 | 3, 250 | 8, 916 | 5, 735 | 35 |
| Mussels, sea [1] | 11, 550 | 18, 150 | 17, 050 | 21, 450 | 29, 150 | 29, 150 |
| Scallops, sea [2] | 79, 155 | 28, 278 | 93, 276 | 89, 199 | 236, 673 | 291, 357 |
| Squid | 33, 209 | 27, 645 | 116, 245 | 78, 056 | 7, 730 | 557 |
| Total | 153, 137 | 92, 963 | 240, 671 | 197, 621 | 280, 788 | 321, 099 |
| Grand total | 3, 397, 570 | 2, 895, 652 | 5, 254, 380 | 5, 404, 547 | 4, 361, 407 | 3, 098, 673 |

| Species | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Albacore | | | 1, 253 | | | | 1, 253 |
| Alewives | | | 320 | 940 | | | 1, 260 |
| Bluefish | 10, 152 | 83, 618 | 34, 572 | 13, 302 | 1, 012 | | 144, 390 |
| Bonito | 20 | 39 | 1, 013 | 1, 701 | | | 2, 773 |
| Butterfish | 64, 653 | 54, 120 | 81, 316 | 76, 980 | 43, 495 | 273, 677 | 3, 149, 679 |
| Cod: | | | | | | | |
| Large | 83, 305 | 32, 075 | 62, 865 | 50, 015 | 58, 374 | 71, 904 | 1, 583, 614 |
| Market | 431, 420 | 373, 735 | 348, 315 | 269, 330 | 240, 353 | 179, 870 | 3, 063, 723 |
| Steak | 85, 790 | 186, 470 | 75, 120 | 10, 000 | | | 551, 190 |
| Croaker | 6, 060 | | 9, 670 | 42, 760 | | | 79, 135 |
| Cunner (bergall) | 1, 140 | | | 243 | | | 1, 638 |
| Cusk | 85 | | | | | | 2, 675 |
| Dabs, sea | | | | | | | 2, 175 |
| Dogfish | | | | | | | 315 |
| Eels: | | | | | | | |
| Common | | | | | | | 100 |
| Conger (sea) | | | | 310 | 1, 710 | 50 | 50, 112 |
| Eel pout (conger eel) | | | | | | | 1, 735 |
| Flounders | 159, 165 | 238, 730 | 336, 180 | 579, 283 | 220, 583 | 160, 925 | 3, 146, 502 |
| Fluke | 1, 276 | 535 | 7, 851 | 8, 375 | 5, 823 | 9, 141 | 987, 445 |
| Goosefish (bellyfish) | | | | | 280 | | 3, 650 |
| Haddock | 1, 419, 117 | 1, 254, 563 | 1, 235, 093 | 555, 293 | 648, 665 | 711, 365 | 12, 595, 740 |
| Hake | 51, 425 | 22, 960 | 30, 902 | 7, 514 | 5, 385 | 5, 260 | 297, 597 |
| Halibut | 1, 896 | 961 | 555 | 50 | 523 | 739 | 37, 781 |

See footnotes at end of table.

*Landings by fishing craft at New York City, 1939*—Continued

BY SPECIES AND MONTHS—Continued

| Species | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|
| FISH—continued | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Herring, sea (sardine) | | | | | | | 380 |
| John Dory | | | | | | | 1, 215 |
| King whiting (kingfish) | | | 80 | 110 | | | 190 |
| Mackerel | 903 | 2, 912 | 3, 185 | 9, 783 | 5, 405 | 13, 595 | 964, 586 |
| Menhaden | | | | | | | 60 |
| Pollock | 22, 335 | 9, 160 | 43, 607 | 3, 715 | 6, 100 | 3, 827 | 329, 304 |
| Rosefish | | | | | | | 12, 700 |
| Scup (porgy) | 225, 955 | 104, 695 | 145, 349 | 414, 825 | 261, 475 | 280, 940 | 4, 791, 380 |
| Sea bass | 3, 485 | 12 | 323 | 6, 320 | 2, 047 | 1, 303 | 595, 364 |
| Sea robin | | | | 330 | 3, 615 | 3, 360 | 19, 475 |
| Sea trout, gray (weakfish) | 5, 525 | | 2, 740 | 9, 946 | 1, 250 | | 46, 924 |
| Shad | 10 | 20 | | | | | 117, 628 |
| Sharks | | | | 1, 065 | 450 | 240 | 2, 145 |
| Skate wings | 280 | | 260 | 1, 130 | 5, 175 | 3, 205 | 27, 145 |
| Sole, gray | 235 | | | | | 100 | 95, 223 |
| Spot | | | 680 | 130 | | | 810 |
| Striped bass | | | | | | 7 | 33 |
| Sturgeon | 255 | 500 | | 215 | | | 1, 915 |
| Tautog (blackfish) | 10 | | | 20 | | | 30 |
| Tilefish | | 9, 570 | 630 | | 44, 395 | 50, 715 | 755, 817 |
| Tuna | 32 | | 728 | 97 | | | 857 |
| Whiting | 5, 550 | | 14, 800 | 56, 490 | 21, 750 | 17, 520 | 591, 236 |
| Wolffish (catfish) | | | | | | | 3, 555 |
| Yellowtail (dabs) | 152, 525 | 294, 240 | 292, 050 | 229, 045 | 347, 990 | 475, 890 | 3, 725, 323 |
| Roe | | | | | | | 4, 893 |
| Unclassified | 40 | | 110 | 2, 676 | 190 | 440 | 6, 517 |
| Total | 2, 732, 644 | 2, 668, 915 | 2, 729, 567 | 2, 351, 993 | 1, 926, 045 | 2, 264, 073 | 37, 799, 187 |
| SHELLFISH | | | | | | | |
| Crabs: | | | | | | | |
| Hard | | | | | 875 | 1, 260 | 54, 845 |
| King | | | | | | | 1, 500 |
| Lobsters, common | | | 48 | 60 | 790 | 754 | 25, 841 |
| Mussels, sea [1] | 14, 300 | 23, 650 | 20, 900 | 21, 725 | 13, 750 | 15, 400 | 236, 225 |
| Scallops, sea [2] | 421, 020 | 389, 601 | 293, 877 | 274, 959 | 137, 421 | 136, 989 | 2, 471, 805 |
| Squid | 1, 150 | 410 | 2, 070 | 12, 310 | 5, 548 | 3, 725 | 288, 655 |
| Total | 436, 470 | 413, 661 | 316, 895 | 309, 054 | 158, 384 | 158, 128 | 3, 078, 871 |
| Grand total | 3, 169, 114 | 3, 082, 576 | 3, 046, 462 | 2, 661, 047 | 2, 084, 429 | 2, 422, 201 | 40, 878, 058 |

[1] Data for landings of sea mussels include the weights of the shells.
[2] Data for landings of sea scallops do not include the weight of the shells.

NOTE.—Includes landings by both vessels and boats. Landings are based on weighed-out weights.

## SHAD FISHERY OF THE HUDSON RIVER

The shad fishery of the Hudson River in 1938 was prosecuted by 875 fishermen who used 375 boats, 18 haul seines, 233 drift gill nets, and 366 stake gill nets. The total commercial catch amounted to 711,799 shad, having a weight of 2,467,000 pounds, and a value to the fishermen of $172,475. This is a decrease of 19 percent in the number of shad and also 19 percent in their value as compared with 1937. The average price per pound received by the fisherman was about 7 cents, compared with a price of approximately 8 cents in 1937.

Stake gill nets accounted for 61 percent of the weight of shad taken; drift gill nets, 38 percent; and haul seines, 1 percent.

Statistics of the catch of shad in the Hudson River also are included in the catch data for New York and New Jersey which are published elsewhere in this report.

*Shad fishery of the Hudson River, 1938*

| Item | New York | | | New Jersey | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| OPERATING UNITS | | | | | | | | | |
| Fishermen: | | | | | | | | | |
| On boats and shore: | *Number* | | | *Number* | | | *Number* | | |
| Regular | 50 | | | 103 | | | 153 | | |
| Casual | 569 | | | 153 | | | 722 | | |
| Total | 619 | | | 256 | | | 875 | | |
| Boats: | | | | | | | | | |
| Motor | ------ | | | 1 | | | 1 | | |
| Other | 299 | | | 75 | | | 374 | | |
| Apparatus: | | | | | | | | | |
| Haul seines | 18 | | | ------ | | | 18 | | |
| Length, yards | 2,574 | | | ------ | | | 2,574 | | |
| Gill nets: | | | | | | | | | |
| Drift | 232 | | | 1 | | | 233 | | |
| Square yards | 727,751 | | | 1,360 | | | 729,111 | | |
| Stake | 301 | | | 65 | | | 366 | | |
| Square yards | 6,993 | | | 144,479 | | | 151,472 | | |
| CATCH | *Number* | *Pounds* | *Value* | *Number* | *Pounds* | *Value* | *Number* | *Pounds* | *Value* |
| Haul seine | 3,480 | 11,600 | $620 | ------ | ------ | ------ | 3,480 | 11,600 | $620 |
| Drift gill nets | 283,700 | 946,000 | 52,554 | 70 | 200 | $12 | 283,770 | 946,200 | 52,566 |
| Stake gill nets | 4,470 | 14,900 | 815 | 420,079 | 1,494,300 | 118,474 | 424,549 | 1,509,200 | 119,289 |
| Total | 291,650 | 972,500 | 53,989 | 420,149 | 1,494,500 | 118,486 | 711,799 | 2,467,000 | 172,475 |

## FISHERIES OF THE CHESAPEAKE BAY STATES

(Area XXIII)[9]

The yield of the commercial fisheries of the Chesapeake Bay States (Maryland and Virginia) during 1938 amounted to 294,593,900 pounds, valued at $6,662,951 to the fishermen, representing an increase of 1 percent in volume and 5 percent in value as compared with the catch in the previous year. These fisheries gave employment to 15,297 fishermen, as compared with 16,529 in 1937.

There were 582 fishery wholesale and manufacturing establishments in the two States in 1938, as compared with 561 in 1937. In 1938 these establishments employed 12,844 persons, paid $3,135,628 in salaries and wages, and produced manufactured products (canned, cured, packaged and byproducts), valued at $9,224,417. In 1937 the wholesale and manufacturing firms employed 12,005 persons, paid $3,068,069 in salaries and wages, and produced manufactured products valued at $10,009,939.

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[9] This is the number given to this area by the North American Council on Fishery Investigations. It should be explained that there may be included under this area, craft whose principal fishing ports are in the area but at times fish elsewhere. Data on the operating units and catch of the fisheries of the Chesapeake Bay States have been taken largely from statistics collected by the State fishery agencies of Maryland and Virginia. Supplementary surveys, compilations, and analyses have been made by agents of this Bureau in order that the figures may be presented in a manner comparable with those of other sections. It should be observed that the persons engaged, gear and craft employed, and the catch of the seed oyster fishery are not included among the statistics of the fishery for market oysters and other species but are shown in separate tables in this section.

## *Fisheries of the Chesapeake Bay States, 1938*

### SUMMARY OF CATCH

| Product | Maryland | | Virginia | | Total | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Fish | 14, 114, 100 | $437, 684 | 188, 708, 600 | $2, 152, 300 | 202, 822, 700 | $2, 589, 984 |
| Shellfish, etc | 43, 149, 100 | 1, 822, 104 | 48, 622, 100 | 2, 250, 863 | 91, 771, 200 | 4, 072, 967 |
| Total | 57, 263, 200 | 2, 259, 788 | 237, 330, 700 | 4, 403, 163 | 294, 593, 900 | 6, 662, 951 |

### OPERATING UNITS: BY STATES

| Item | Maryland | Virginia | Total |
|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* |
| On vessels | 748 | 1, 789 | 2, 537 |
| On boats and shore: | | | |
| Regular | 3, 591 | 4, 217 | 7, 808 |
| Casual | 2, 118 | 2, 834 | 4, 952 |
| Total | 6, 457 | 8, 840 | 15, 297 |
| Vessels: | | | |
| Steam | | 25 | 25 |
| Net tonnage | | 2, 880 | 2, 880 |
| Motor | 30 | 149 | 179 |
| Net tonnage | 207 | 2, 598 | 2, 805 |
| Sail | 137 | | 137 |
| Net tonnage | 1, 703 | | 1, 703 |
| Total vessels | 167 | 174 | 341 |
| Total net tonnage | 1, 910 | 5, 478 | 7, 388 |
| Boats: | | | |
| Motor | 2, 669 | 3, 324 | 5, 993 |
| Other | 1, 598 | 3, 687 | 5, 285 |
| Accessory boats | | 99 | 99 |
| Apparatus: | | | |
| Purse seines, menhaden | | 33 | 33 |
| Length, yards | | 10, 890 | 10, 890 |
| Haul seines | 178 | 148 | 326 |
| Length, yards | 32, 018 | 63, 888 | 95, 906 |
| Gill nets: | | | |
| Anchor | 433 | | 433 |
| Square yards | 77, 558 | | 77, 558 |
| Drift | 251 | 234 | 485 |
| Square yards | 217, 592 | 206, 751 | 424, 343 |
| Runaround | | 10 | 10 |
| Square yards | | 5, 369 | 5, 369 |
| Stake | 3, 200 | 4, 863 | 8, 063 |
| Square yards | 271, 900 | 222, 870 | 494, 770 |
| Lines: | | | |
| Hand | 100 | 300 | 400 |
| Hooks | 120 | 400 | 520 |
| Trot with baits or snoods | 1, 766 | 1, 603 | 3, 369 |
| Baits or snoods | 1, 214, 800 | 928, 900 | 2, 143, 700 |
| Trot with hooks | | 6 | 6 |
| Hooks | | 1, 600 | 1, 600 |
| Pound nets | 548 | 1, 871 | 2, 419 |
| Fyke nets: | | | |
| Crab [1] | | 408 | 408 |
| Fish | 1, 871 | 621 | 2, 492 |
| Dip nets | 670 | 954 | 1, 624 |
| Otter trawls | | 28 | 28 |
| Yards at mouth | | 776 | 776 |
| Slat traps | | 5 | 5 |
| Pots: | | | |
| Crab | 55 | 740 | 795 |
| Eel | 14, 236 | 734 | 14, 970 |
| Fish | 200 | 245 | 445 |
| Turtle | | 35 | 35 |
| Scrapes | 614 | 170 | 784 |
| Yards at mouth | 614 | 194 | 808 |
| Dredges: | | | |
| Crab | | 296 | 296 |
| Yards at mouth | | 485 | 485 |
| Oyster | 380 | 67 | 447 |
| Yards at mouth | 442 | 108 | 550 |
| Tongs: | | | |
| Oyster | 3, 975 | 2, 098 | 6, 073 |
| Other | 64 | 241 | 305 |
| Rakes: | | | |
| Oyster | 56 | 192 | 248 |
| Other | | 241 | 241 |
| Picks | | 100 | 100 |

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[1] Formerly listed as crab pound nets.

*Fisheries of the Chesapeake Bay States, 1938*—Continued

CATCH: BY STATES

| Species | Maryland | | Virginia | | Total | |
|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 5, 396, 600 | $51, 228 | 17, 690, 900 | $164, 057 | 23, 087, 500 | $215, 285 |
| Black bass | 93, 400 | 9, 577 | | | 93, 400 | 9, 577 |
| Bluefish | 51, 200 | 4, 711 | 303, 100 | 17, 414 | 354, 300 | 22, 125 |
| Bonito | 6, 900 | 295 | 34, 800 | 1, 044 | 41, 700 | 1, 339 |
| Butterfish | 64, 900 | 2, 906 | 3, 140, 000 | 41, 960 | 3, 204, 900 | 44, 866 |
| Cabio or crab eater | 100 | 5 | 22, 700 | 1, 061 | 22, 800 | 1, 066 |
| Carp | 285, 000 | 16, 505 | 539, 200 | 33, 151 | 824, 200 | 49, 656 |
| Catfish and bullheads | 517, 200 | 17, 151 | 664, 200 | 26, 447 | 1, 181, 400 | 43, 598 |
| Cod | | | 400 | 13 | 400 | 13 |
| Crappie | 2, 500 | 136 | | | 2, 500 | 136 |
| Croaker | 3, 024, 900 | 40, 084 | 43, 284, 500 | 558, 819 | 46, 309, 400 | 598, 903 |
| Drum: | | | | | | |
| Black | 9, 000 | 99 | 116, 800 | 1, 024 | 125, 800 | 1, 123 |
| Red or redfish | 2, 500 | 42 | 133, 600 | 1, 789 | 136, 100 | 1, 831 |
| Eels: | | | | | | |
| Common | 133, 700 | 10, 448 | 161, 700 | 16, 998 | 295, 400 | 27, 446 |
| Conger | 200 | 2 | 3, 700 | 45 | 3, 900 | 47 |
| Flounders | 65, 900 | 3, 452 | 772, 100 | 42, 329 | 838, 000 | 45, 781 |
| Gizzard shad | 135, 100 | 1, 793 | 426, 500 | 5, 230 | 561, 600 | 7, 023 |
| Hake | | | 12, 100 | 179 | 12, 100 | 179 |
| Harvestfish or "starfish" | 1, 500 | 54 | 488, 500 | 8, 293 | 490, 000 | 8, 347 |
| Hickory shad | 26, 100 | 541 | 140, 400 | 2, 651 | 166, 500 | 3, 192 |
| Hogchoker | 2, 000 | 70 | | | 2, 000 | 70 |
| Hogfish | | | 400 | 8 | 400 | 8 |
| King whiting or "kingfish" | 3, 700 | 195 | 261, 000 | 10, 922 | 264, 700 | 11, 117 |
| Mackerel | 2, 500 | 250 | 17, 400 | 889 | 19, 900 | 1, 139 |
| Menhaden | 62, 800 | 328 | 95, 020, 500 | 360, 948 | 95, 083, 300 | 361, 276 |
| Mullet | 3, 600 | 170 | 23, 400 | 945 | 27, 000 | 1, 115 |
| Pike or pickerel | 43, 900 | 6, 540 | 2, 200 | 370 | 46, 100 | 6, 910 |
| Pollock | | | 100 | 1 | 100 | 1 |
| Sand perch | | | 7, 300 | 97 | 7, 300 | 97 |
| Scup or porgy | 22, 000 | 270 | 2, 343, 800 | 38, 250 | 2, 365, 800 | 38, 520 |
| Sea bass | 42, 000 | 1, 680 | 301, 600 | 13, 007 | 343, 600 | 14, 687 |
| Sea robin | | | 3, 000 | 30 | 3, 000 | 30 |
| Shad | 599, 700 | 61, 135 | 3, 607, 600 | 332, 799 | 4, 207, 300 | 393, 934 |
| Shark | | | 237, 300 | 2, 756 | 237, 300 | 2, 756 |
| Skates | | | 8, 600 | 115 | 8, 600 | 115 |
| Spanish mackerel | 20, 400 | 1, 278 | 437, 000 | 29, 536 | 457, 400 | 30, 814 |
| Spot | 59, 900 | 1, 643 | 3, 865, 800 | 71, 874 | 3, 925, 700 | 73, 517 |
| Squeteagues or "sea trout": | | | | | | |
| Gray | 1, 069, 100 | 35, 147 | 12, 547, 400 | 225, 865 | 13, 616, 500 | 261, 012 |
| Spotted | 8, 200 | 767 | 393, 700 | 32, 322 | 401, 900 | 33, 089 |
| Striped bass | 1, 714, 400 | 140, 270 | 1, 155, 000 | 91, 293 | 2, 869, 400 | 231, 563 |
| Sturgeon | 100 | 14 | 15, 700 | 2, 236 | 15, 800 | 2, 250 |
| Suckers | 4, 500 | 209 | | | 4, 500 | 209 |
| Sunfish | 9, 000 | 181 | | | 9, 000 | 181 |
| Swellfish | | | 33, 800 | 780 | 33, 800 | 780 |
| Tautog | 500 | 17 | 1, 100 | 18 | 1, 600 | 35 |
| Tomcod | | | 7, 400 | 79 | 7, 400 | 79 |
| White perch | 436, 600 | 17, 097 | 290, 200 | 8, 817 | 726, 800 | 25, 914 |
| Whiting | | | 139, 500 | 2, 570 | 139, 500 | 2, 570 |
| Yellow perch | 192, 500 | 11, 394 | 52, 600 | 3, 269 | 245, 100 | 14, 663 |
| Total | 14, 114, 100 | 437, 684 | 188, 708, 600 | 2, 152, 300 | 202, 822, 700 | 2, 589, 984 |
| SHELLFISH, ETC. | | | | | | |
| Crabs: | | | | | | |
| Hard | 20, 699, 100 | 385, 230 | 28, 690, 400 | 486, 098 | 49, 389, 500 | 871, 328 |
| Soft and peelers | 2, 898, 400 | 224, 760 | 2, 782, 600 | 211, 179 | 5, 681, 000 | 435, 939 |
| Lobsters | 100 | 20 | 1, 400 | 157 | 1, 500 | 177 |
| Shrimp | | | 8, 000 | 980 | 8, 000 | 980 |
| Clams: [1] | | | | | | |
| Hard, public | 53, 400 | 10, 020 | 2, 757, 800 | 370, 048 | 2, 811, 200 | 380, 068 |
| Hard, private | | | 52, 200 | 5, 000 | 52, 200 | 5, 000 |
| Soft, public | | | 2, 500 | 1, 000 | 2, 500 | 1, 000 |
| Mussels, sea | | | 30, 000 | 900 | 30, 000 | 900 |
| Oysters, market: [2] | | | | | | |
| Public, spring | 5, 300, 300 | 314, 159 | 1, 611, 200 | 141, 855 | 6, 911, 500 | 456, 014 |
| Public, fall | 12, 764, 300 | 740, 921 | 2, 751, 800 | 244, 596 | 15, 516, 100 | 985, 517 |
| Private, spring | 501, 000 | 65, 779 | 3, 506, 700 | 297, 323 | 4, 007, 700 | 363, 102 |
| Private, fall | 797, 400 | 77, 300 | 6, 179, 600 | 487, 736 | 6, 977, 000 | 565, 036 |

[1] Statistics on hard clams used in this table are based on yields of 6.14 pounds of meats per standard bushel in Maryland, and 5.73 pounds of meats in Virginia.

[2] Statistics on market oysters used in this table are based on yields of 4.67 pounds of meats per standard bushel in Maryland, and 4.24 pounds of meats in Virginia.

## *Fisheries of the Chesapeake Bay States, 1938*—Continued

### CATCH: BY STATES—Continued

| Species | Maryland | | Virginia | | Total | |
|---|---|---|---|---|---|---|
| SHELLFISH, ETC.—continued | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Squid | 130, 000 | $1, 300 | 233, 000 | $2, 851 | 363, 000 | $4, 151 |
| Terrapin, diamond-back | 4, 500 | 2, 579 | 4, 300 | 150 | 8, 800 | 2, 729 |
| Turtles, snapper | 600 | 36 | 10, 600 | 990 | 11, 200 | 1, 026 |
| Total | 43, 149, 100 | 1, 822, 104 | 48, 622, 100 | 2, 250, 863 | 91, 771, 200 | 4, 072, 967 |
| Grand total | 57, 263, 200 | 2, 259, 788 | 237, 330, 700 | 4, 403, 163 | 294, 593, 900 | 6, 662, 951 |

NOTE.—Data on the yield of shellfish meats per bushel are based on U. S. Standard Bushels of 2,150.4 cubic inches capacity. Prior to 1938, yields were based on bushels of the size prescribed by individual State regulations. The seed-oyster fishery in the Chesapeake Bay States was prosecuted only in Virginia, where 1,440 fishermen, using 14 motor vessels, 542 motorboats, 162 other boats, 957 tongs, and 112 rakes, took 1,234,140 bushels of seed oysters valued at $231,958 from public beds. Of the total number of persons fishing for seed oysters, 665 are duplicated among those fishing for market oysters or other species. Similarly, the following craft and gear are duplicated: 229 motorboats, 150 other boats, 341 tongs, and 112 rakes.

### SUPPLEMENTARY TABLE SHOWING THE PRODUCTION OF CERTAIN SHELLFISH, IN NUMBER AND BUSHELS

| Product | Maryland | | Virginia | | Total | |
|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Crabs: | | | | | | |
| Hard ........ number | 62, 097, 300 | $385, 230 | 86, 071, 200 | $486, 098 | 148, 168, 500 | $871, 328 |
| Soft and peelers ........ do | 11, 593, 600 | 224, 760 | 11, 130, 400 | 211, 179 | 22, 724, 000 | 435, 939 |
| Clams: | | | | | | |
| Hard, public ........ bushels | 8, 697 | 10, 020 | 481, 291 | 370, 048 | 489, 988 | 380, 068 |
| Hard, private ........ do | | | 9, 110 | 5, 000 | 9, 110 | 5, 000 |
| Soft, public ........ do | | | 349 | 1, 000 | 349 | 1, 000 |
| Mussels, sea ........ do | | | 4, 190 | 900 | 4, 190 | 900 |
| Oysters, market: | | | | | | |
| Public, spring ........ do | 1, 134, 968 | 314, 159 | 380, 000 | 141, 855 | 1, 514, 968 | 456, 014 |
| Public, fall ........ do | 2, 733, 255 | 740, 921 | 649, 009 | 244, 596 | 3, 382, 264 | 985, 517 |
| Private, spring ........ do | 107, 281 | 65, 779 | 827, 052 | 297, 323 | 934, 333 | 363, 102 |
| Private, fall ........ do | 170, 749 | 77, 300 | 1, 457, 453 | 487, 736 | 1, 628, 202 | 565, 036 |

NOTE.—Bushels represent U. S. Standard Bushels of 2,150.4 cubic inches capacity. Prior to 1938, data on bushels of shellfish were based on bushel measures of the size prescribed by individual State regulations. For more detailed information concerning shellfish measures the reader is referred to the section on conversion factors published on p. 548 of this document.

## *Industries related to the fisheries of the Chesapeake Bay States, 1938*

### OPERATING UNITS, SALARIES, AND WAGES

| Item | Maryland | Virginia | Total |
|---|---|---|---|
| Transporting: | *Number* | *Number* | *Number* |
| Persons engaged | 276 | 911 | 1, 187 |
| Vessels, motor | 141 | 452 | 593 |
| Net tonnage | 1, 967 | 4, 578 | 6, 545 |
| Wholesale and manufacturing: | | | |
| Establishments | 321 | 261 | 582 |
| Persons engaged: | | | |
| Proprietors | 449 | 288 | 737 |
| Salaried employees | 190 | 189 | 379 |
| Wage earners: | | | |
| Average for season | 6, 178 | 5, 550 | 11, 728 |
| Average for year | 2, 732 | 2, 338 | 5, 070 |
| Paid to salaried employees | $182, 185 | $281, 876 | $464, 061 |
| Paid to wage earners | $1, 615, 286 | $1, 056, 281 | $2, 671, 567 |
| Total salaries and wages | $1, 797, 471 | $1, 338, 157 | $3, 135, 628 |
| Fishermen manufacturing | 128 | | 128 |

*Industries related to the fisheries of the Chesapeake Bay States, 1938*—Continued

PRODUCTS MANUFACTURED

| Item | Maryland | | Virginia | |
|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments: | | | | |
| Alewives: | | | | |
| Salted: | | | | |
| Corned ... pounds | (1) | (1) | 1,566,155 | $37,073 |
| Pickled ... do | 2,511,860 | $78,877 | 2,263,390 | 47,346 |
| Tight-pack cut ... do | ----- | ----- | 1,166,350 | 38,164 |
| Canned ... standard cases | 31,762 | 93,066 | 15,494 | 33,560 |
| Roe, canned ... do | 12,132 | 57,661 | 16,550 | 68,662 |
| Oil ... gallons | ----- | ----- | 12,681 | 2,277 |
| Butterfish, smoked ... pounds | 51,000 | 12,200 | ----- | ----- |
| Carp, smoked ... do | 12,850 | 3,462 | ----- | ----- |
| Chub, cisco, and tullibee, smoked ... do | 135,000 | 38,250 | ----- | ----- |
| Croaker: | | | | |
| Fresh fillets ... do | ----- | ----- | 140,000 | 13,950 |
| Fresh pan-dressed ... do | ----- | ----- | 280,000 | 21,000 |
| Eels, smoked ... do | 23,000 | 6,900 | ----- | ----- |
| Flounders, fresh fillets ... do | ----- | ----- | 54,000 | 8,400 |
| Herring, sea, smoked ... do | 90,500 | 8,860 | ----- | ----- |
| Menhaden: | | | | |
| Dry scrap ... tons | ----- | ----- | 9,374 | 341,346 |
| Oil ... gallons | ----- | ----- | 1,087,503 | 319,065 |
| Salmon, smoked ... pounds | 221,000 | 67,300 | ----- | ----- |
| Sea bass: | | | | |
| Fresh fillets ... do | ----- | ----- | 94,000 | 13,880 |
| Fresh pan-dressed ... do | ----- | ----- | 95,000 | 9,900 |
| Squeteague, gray: | | | | |
| Fresh fillets ... do | ----- | ----- | 262,000 | 34,120 |
| Fresh pan-dressed ... do | ----- | ----- | 365,000 | 25,800 |
| Whitefish, smoked ... do | 28,800 | 8,680 | ----- | ----- |
| Crab meat, packaged, fresh-cooked ... do | 3,047,965 | 948,377 | 2,157,354 | 672,718 |
| Oysters: | | | | |
| Fresh-shucked ... gallons | 2,415,064 | 2,589,081 | 1,579,493 | 1,825,255 |
| Shell products: | | | | |
| Poultry feed ... tons | 32,200 | 145,800 | 21,569 | 123,071 |
| Lime ... do | 19,970 | 35,800 | 17,223 | 91,327 |
| Lime, burned ... do | ----- | ----- | 14,789 | 93,338 |
| Unclassified products: | | | | |
| Packaged, fresh and frozen fillets, and pan-dressed ... pounds | ----- | ----- | [2] 104,200 | [2] 9,114 |
| Smoked ... do | [3] 46,500 | [3] 18,550 | ----- | ----- |
| Canned ... standard cases | [4] 189,544 | [4] 344,259 | (1) | (1) |
| Dry scrap and meal ... tons | (4) | (4) | [5] 3,618 | [5] 114,994 |
| Miscellaneous | ----- | [6] 812,217 | ----- | [7] 10,717 |
| Total | ----- | 5,269,340 | ----- | 3,955,077 |
| By fishermen: | | | | |
| Alewives: | | | | |
| Pickled ... pounds | 283,800 | 4,290 | ----- | ----- |
| Smoked ... do | 500 | 40 | ----- | ----- |
| Eels, salted ... do | 132,854 | 12,179 | ----- | ----- |
| Hogchoker, salted ... do | 11,000 | 500 | ----- | ----- |
| Total | 428,154 | 17,009 | ----- | ----- |
| Grand total | ----- | 5,286,349 | ----- | 3,955,077 |

---

[1] The production of this item is included under "Miscellaneous."

[2] Includes fresh fillets of scup, sea robin, Spanish mackerel, and swellfish; frozen fillets of croaker; fresh sticks of swellfish; and fresh pan-dressed king whiting, scup, and Spanish mackerel.

[3] Includes smoked alewives, sablefish, shad, sturgeon, and lake trout.

[4] Includes canned hard-clam chowder, oysters, oyster soup, shrimp soup, fish paste, terrapin products, and fish for animal food.

[5] Includes menhaden, starfish, and miscellaneous fish meals; menhaden acid scrap; and alewife, blue-crab, and miscellaneous dry scrap.

[6] Includes corned alewives, blue-crab dry scrap, and marine-shell buttons and novelties.

[7] Includes fresh-shucked clams, salted tight-pack roe alewives, canned crab, and miscellaneous oil.

NOTE.—The total value of manufactured products in the Chesapeake Bay States was as follows: By manufacturing establishments, $9,224,417, and by fishermen, $17,009. Some of the above products may have been imported from another State or a foreign country; therefore, they cannot be correlated directly with the catch within the State. Of the total number of persons engaged on transporting vessels, 1,073 have been included as fishermen, and among the total number of persons engaged in the preparation of fishermen's prepared products, all have been included as fishermen.

## MARYLAND

### *Fisheries of Maryland, 1938*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Gill nets | | | Lines | |
|---|---|---|---|---|---|---|
| | | Anchor | Drift | Stake | Hand | Trot with baits or snoods |
| Fishermen, on boats and shore: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Regular | 364 | 30 | 57 | 112 | | 1,249 |
| Casual | 182 | 33 | 223 | 117 | 40 | 222 |
| Total | 546 | 63 | 280 | 229 | 40 | 1,471 |
| Boats: | | | | | | |
| Motor | 97 | 31 | 76 | 102 | 20 | 1,328 |
| Other | 159 | 13 | 91 | 59 | | 130 |
| Apparatus: | | | | | | |
| Number | 178 | 433 | 251 | 3,200 | 100 | 1,766 |
| Length, yards | 32,018 | | | | | |
| Square yards | | 77,558 | 217,592 | 271,900 | | |
| Hooks, baits, or snoods | | | | | 120 | 1,214,800 |

| Item | Pound nets | Fyke nets | Dip nets | Pots | | | Scrapes |
|---|---|---|---|---|---|---|---|
| | | | | Crab | Eel | Fish | |
| Fishermen, on boats and shore: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Regular | 380 | 63 | 354 | 9 | 172 | 2 | 307 |
| Casual | 111 | 86 | 316 | | 35 | | |
| Total | 491 | 149 | 670 | 9 | 207 | 2 | 307 |
| Boats: | | | | | | | |
| Motor | 169 | 60 | | 9 | 113 | 1 | |
| Other | 115 | 68 | 670 | | 23 | | 307 |
| Apparatus: | | | | | | | |
| Number | 548 | 1,871 | 670 | 55 | 14,236 | 200 | 614 |
| Yards at mouth | | | | | | | 614 |

| Item | Dredges, oyster | Tongs | | Rakes, oyster | By hand, other than for oysters | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| | | Oyster | Other | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 694 | 54 | | | | 748 |
| On boats and shore: | | | | | | |
| Regular | 86 | 3,036 | 51 | 20 | 47 | 3,591 |
| Casual | | 885 | 13 | 36 | 13 | 2,118 |
| Total | 780 | 3,975 | 64 | 56 | 60 | 6,457 |
| Vessels: | | | | | | |
| Motor | 3 | 27 | | | | 30 |
| Net tonnage | 28 | 179 | | | | 207 |
| Sail | 137 | | | | | 137 |
| Net tonnage | 1,703 | | | | | 1,703 |
| Total vessels | 140 | 27 | | | | 167 |
| Total net tonnage | 1,731 | 179 | | | | 1,910 |
| Boats: | | | | | | |
| Motor | 33 | 1,852 | 21 | 10 | | 2,669 |
| Other | 33 | 121 | 62 | 19 | 11 | 1,598 |
| Apparatus: | | | | | | |
| Number | 380 | 3,975 | 64 | 56 | | |
| Yards at mouth | 412 | | | | | |

### *Fisheries of Maryland, 1938*—Continued

CATCH: BY GEAR

| Species | Haul seines | | Gill nets | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Anchor | | Drift | | Stake | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 77,700 | $839 | 2,700 | $44 | 35,600 | $1,053 | 28,900 | $727 |
| Black bass | 57,300 | 5,804 | ----- | ----- | ----- | ----- | 200 | 16 |
| Bluefish | 8,200 | 758 | ----- | ----- | ----- | ----- | 3,700 | 296 |
| Butterfish | 500 | 20 | ----- | ----- | ----- | ----- | ----- | ----- |
| Carp | 252,600 | 15,066 | ----- | ----- | 1,000 | 20 | 1,400 | 66 |
| Catfish and bullheads | 184,000 | 6,092 | ----- | ----- | 200 | 6 | 3,500 | 135 |
| Crappie | 1,500 | 73 | ----- | ----- | ----- | ----- | ----- | ----- |
| Croaker | 510,500 | 10,523 | ----- | ----- | 2,300 | 57 | 5,500 | 78 |
| Eels, common | 1,300 | 115 | ----- | ----- | ----- | ----- | ----- | ----- |
| Flounders | 2,500 | 120 | ----- | ----- | ----- | ----- | 1,500 | 60 |
| Gizzard shad | 54,000 | 761 | 500 | 10 | 600 | 30 | 7,200 | 79 |
| Hickory shad | ----- | ----- | ----- | ----- | 100 | 3 | ----- | ----- |
| Mullet | ----- | ----- | ----- | ----- | ----- | ----- | 3,000 | 150 |
| Pike or pickerel | 18,600 | 2,927 | ----- | ----- | ----- | ----- | 500 | 80 |
| Shad | 4,800 | 311 | 3,200 | 280 | 72,700 | 7,896 | 38,600 | 3,886 |
| Spot | 26,800 | 700 | ----- | ----- | ----- | ----- | 1,000 | 50 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 48,700 | 2,262 | 100 | 7 | 500 | 25 | 300 | 25 |
| Spotted | 1,900 | 200 | ----- | ----- | ----- | ----- | ----- | ----- |
| Striped bass | 463,000 | 38,139 | 67,200 | 5,683 | 269,500 | 20,555 | 247,600 | 20,260 |
| Sturgeon | ----- | ----- | ----- | ----- | 100 | 14 | ----- | ----- |
| Suckers | 700 | 33 | ----- | ----- | ----- | ----- | ----- | ----- |
| Sunfish | 2,600 | 39 | ----- | ----- | ----- | ----- | ----- | ----- |
| White perch | 76,700 | 2,872 | 200 | 16 | 4,800 | 360 | 27,000 | 1,488 |
| Yellow perch | 40,700 | 3,064 | ----- | ----- | ----- | ----- | 1,900 | 125 |
| Crabs, soft and peelers | 71,500 | 7,034 | ----- | ----- | ----- | ----- | ----- | ----- |
| Total | 1,906.100 | 97,752 | 73,900 | 6,040 | 387,400 | 30,019 | 371,800 | 27,521 |

| Species | Lines | | | | Pound nets | | Fyke nets | |
|---|---|---|---|---|---|---|---|---|
| | Hand | | Trot with baits or snoods | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | ----- | ----- | ----- | ----- | 5,243,800 | $48,437 | 7,900 | $128 |
| Black bass | ----- | ----- | ----- | ----- | 2,200 | 185 | 33,700 | 3,572 |
| Bluefish | 20,000 | $2,000 | ----- | ----- | 19,300 | 1,657 | ----- | ----- |
| Bonito | 5,000 | 200 | ----- | ----- | 1,900 | 95 | ----- | ----- |
| Butterfish | ----- | ----- | ----- | ----- | 64,300 | 2,876 | 100 | 10 |
| Cabio or crab eater | ----- | ----- | ----- | ----- | 100 | 5 | ----- | ----- |
| Carp | ----- | ----- | ----- | ----- | 17,300 | 575 | 12,700 | 778 |
| Catfish and bullheads | ----- | ----- | ----- | ----- | 101,000 | 2,800 | 225,500 | 8,028 |
| Crappie | ----- | ----- | ----- | ----- | 300 | 28 | 700 | 35 |
| Croaker | ----- | ----- | ----- | ----- | 2,505,200 | 29,393 | 1,400 | 33 |
| Drum: | | | | | | | | |
| Black | ----- | ----- | ----- | ----- | 9,000 | 99 | ----- | ----- |
| Red or redfish | ----- | ----- | ----- | ----- | 2,500 | 42 | ----- | ----- |
| Eels: | | | | | | | | |
| Common | ----- | ----- | ----- | ----- | 9,000 | 553 | 4,900 | 409 |
| Conger | 200 | 2 | ----- | ----- | ----- | ----- | ----- | ----- |
| Flounders | ----- | ----- | ----- | ----- | 58,900 | 3,122 | 3,000 | 150 |
| Gizzard shad | ----- | ----- | ----- | ----- | 71,100 | 890 | 1,700 | 23 |
| Harvestfish | ----- | ----- | ----- | ----- | 1,500 | 54 | ----- | ----- |
| Hickory shad | ----- | ----- | ----- | ----- | 26,000 | 538 | ----- | ----- |
| Hogchoker | ----- | ----- | ----- | ----- | 2,000 | 70 | ----- | ----- |
| King whiting or "kingfish" | ----- | ----- | ----- | ----- | 3,700 | 195 | ----- | ----- |
| Mackerel | ----- | ----- | ----- | ----- | 2,500 | 250 | ----- | ----- |
| Menhaden | ----- | ----- | ----- | ----- | 62,800 | 328 | ----- | ----- |
| Mullet | ----- | ----- | ----- | ----- | 400 | 12 | 200 | 8 |
| Pike or pickerel | ----- | ----- | ----- | ----- | 1,700 | 242 | 23,100 | 3.291 |
| Scup | 10,000 | 100 | ----- | ----- | 12,000 | 170 | ----- | ----- |
| Sea bass | 12,000 | 480 | ----- | ----- | ----- | ----- | ----- | ----- |
| Shad | ----- | ----- | ----- | ----- | 478,100 | 48,429 | 100 | 10 |
| Spanish mackerel | ----- | ----- | ----- | ----- | 20,400 | 1,278 | ----- | ----- |
| Spot | ----- | ----- | ----- | ----- | 32,100 | 893 | ----- | ----- |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 3,000 | 240 | ----- | ----- | 1,016,500 | 32,588 | ----- | ----- |
| Spotted | ----- | ----- | ----- | ----- | 6,300 | 567 | ----- | ----- |
| Striped bass | ----- | ----- | ----- | ----- | 662,900 | 55,277 | 4,200 | 356 |
| Suckers | ----- | ----- | ----- | ----- | 300 | 9 | 3,500 | 167 |
| Sunfish | ----- | ----- | ----- | ----- | 400 | 19 | 6,000 | 123 |
| Tautog | 400 | 16 | ----- | ----- | ----- | ----- | ----- | ----- |
| White perch | ----- | ----- | ----- | ----- | 217,700 | 7,827 | 110,200 | 4,534 |
| Yellow perch | ----- | ----- | ----- | ----- | 22,300 | 1,116 | 127,600 | 7,089 |
| Crabs: | | | | | | | | |
| Hard | ----- | ----- | 20,529,100 | $381,830 | ----- | ----- | ----- | ----- |
| Soft and peelers | ----- | ----- | 249,600 | 20,879 | 6,300 | 437 | 1,700 | 114 |
| Squid | ----- | ----- | ----- | ----- | 130,000 | 1,300 | ----- | ----- |
| Total | 50,600 | 3,038 | 20,778,700 | 402,709 | 10,811,800 | 242,356 | 568,200 | 28,858 |

## *Fisheries of Maryland, 1938*—Continued

### CATCH: BY GEAR—Continued

| Species | Dip nets | | Pots | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Crab | | Eel | | Fish | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Catfish | -------- | -------- | -------- | -------- | 3, 000 | $90 | -------- | -------- |
| Eels, common | -------- | -------- | -------- | -------- | 118, 500 | 9, 371 | -------- | -------- |
| Sea bass | -------- | -------- | -------- | -------- | -------- | -------- | 30, 000 | $1, 200 |
| Shad | 2, 200 | $323 | -------- | -------- | -------- | -------- | -------- | -------- |
| Tautog | -------- | -------- | -------- | -------- | -------- | -------- | 100 | 1 |
| Crabs: | | | | | | | | |
| Hard | 50, 000 | 1, 000 | 20, 000 | $400 | -------- | -------- | -------- | -------- |
| Soft and peelers | 715, 800 | 65, 872 | 27, 500 | 1, 925 | -------- | -------- | -------- | -------- |
| Lobsters | -------- | -------- | -------- | -------- | -------- | -------- | 100 | 20 |
| Total | 768, 000 | 67, 195 | 47, 500 | 2, 325 | 121, 500 | 9, 461 | 30, 200 | 1, 221 |

| Species | Scrapes | | Dredges | | Tongs | | Rakes | | By hand | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs: | | | | | | | | | | |
| Hard | 100, 000 | $2, 000 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Soft and peelers | 1, 826, 000 | 128, 499 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Clams, hard, public | -------- | -------- | -------- | -------- | 42, 700 | $8, 010 | 8, 000 | $1, 500 | 2, 700 | $510 |
| Oysters, market: | | | | | | | | | | |
| Public, spring | -------- | -------- | 815, 500 | $48, 995 | 4, 484, 800 | 265, 164 | -------- | -------- | -------- | -------- |
| Public, fall | -------- | -------- | 2, 718, 400 | 164, 820 | 10, 045, 900 | 576, 101 | -------- | -------- | -------- | -------- |
| Private, spring | -------- | -------- | 79, 600 | 6, 032 | 421, 400 | 59, 747 | -------- | -------- | -------- | -------- |
| Private, fall | -------- | -------- | 199, 200 | 14, 696 | 598, 200 | 62, 604 | -------- | -------- | -------- | -------- |
| Terrapin, diamond-back | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 4, 500 | 2, 579 |
| Turtle, snapper | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 600 | 36 |
| Total | 1, 926, 000 | 130, 499 | 3, 812, 700 | 234, 543 | 15, 593, 000 | 971, 626 | 8, 000 | 1, 500 | 7, 800 | 3, 125 |

### OPERATING UNITS: BY COUNTIES

| Item | Anne Arundel | Baltimore | Calvert | Caroline | Cecil | Charles | Dorchester | Harford |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 24 | 35 | 27 | -------- | -------- | 4 | 227 | -------- |
| On boats and shore: | | | | | | | | |
| Regular | 387 | 8 | 197 | 6 | 30 | 102 | 476 | 14 |
| Casual | 131 | 53 | 127 | 50 | 77 | 136 | 266 | 37 |
| Total | 542 | 96 | 351 | 56 | 107 | 242 | 969 | 51 |
| Vessels: | | | | | | | | |
| Motor | 10 | -------- | 8 | -------- | -------- | 1 | 9 | -------- |
| Net tonnage | 70 | -------- | 57 | -------- | -------- | 12 | 56 | -------- |
| Sail | 1 | 7 | 2 | -------- | -------- | -------- | 42 | -------- |
| Net tonnage | 19 | 161 | 37 | -------- | -------- | -------- | 407 | -------- |
| Total vessels | 11 | 7 | 10 | -------- | -------- | 1 | 51 | -------- |
| Total net tonnage | 89 | 161 | 94 | -------- | -------- | 12 | 463 | -------- |
| Boats: | | | | | | | | |
| Motor | 253 | 25 | 156 | 16 | 36 | 123 | 467 | 17 |
| Other | 117 | 28 | 82 | 18 | 40 | 27 | 83 | 20 |
| Apparatus: | | | | | | | | |
| Haul seines | 37 | 5 | 9 | 6 | 15 | 23 | 4 | 9 |
| Length, yards | 5, 023 | 645 | 1, 565 | 1, 490 | 3, 485 | 3, 655 | 1, 800 | 2, 655 |
| Gill nets: | | | | | | | | |
| Anchor | -------- | 12 | -------- | -------- | 156 | -------- | -------- | 11 |
| Square yards | -------- | 1, 641 | -------- | -------- | 39, 941 | -------- | -------- | 3, 264 |
| Drift | 3 | -------- | 1 | 60 | 8 | 6 | 33 | 9 |
| Square yards | 4, 800 | -------- | 200 | 31, 682 | 17, 655 | 14, 132 | 36, 164 | 11, 110 |
| Stake | 33 | 40 | 2 | 50 | 25 | 1, 271 | 138 | 185 |
| Square yards | 5, 000 | 5, 939 | 80 | 167 | 2, 075 | 91, 790 | 5, 062 | 17, 329 |
| Lines, trot with baits or snoods | 85 | 30 | 61 | -------- | -------- | 95 | 680 | -------- |
| Baits or snoods | 46, 500 | 15, 000 | 27, 900 | -------- | -------- | 68, 000 | 434, 900 | -------- |
| Pound nets | 30 | 5 | 15 | 12 | 39 | 27 | 117 | 6 |
| Fyke nets | 12 | 44 | -------- | 51 | 932 | 30 | 18 | 370 |
| Dip nets | 69 | 20 | 61 | -------- | -------- | -------- | 35 | -------- |
| Pots, eel | 530 | 450 | -------- | -------- | 1, 085 | 89 | 3, 150 | 425 |
| Dredges, oyster | 2 | 14 | 8 | -------- | -------- | 2 | 84 | -------- |
| Yards at mouth | 3 | 18 | 10 | -------- | -------- | 2 | 105 | -------- |
| Tongs, oyster | 394 | -------- | 346 | -------- | -------- | 153 | 711 | -------- |

## *Fisheries of Maryland, 1938*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Kent | Prince Georges | Queen Annes | St. Marys | Somerset | Talbot | Wicomico | Worcester |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | -------- | -------- | -------- | 5 | 376 | 44 | 6 | -------- |
| On boats and shore: | | | | | | | | |
| Regular | 312 | 1 | 331 | 429 | 475 | 468 | 201 | 154 |
| Casual | 178 | 26 | 181 | 254 | 178 | 78 | 173 | 173 |
| Total | 490 | 27 | 512 | 688 | 1,029 | 590 | 380 | 327 |
| Vessels: | | | | | | | | |
| Motor | -------- | -------- | -------- | -------- | 2 | -------- | -------- | -------- |
| Net tonnage | -------- | -------- | -------- | -------- | 12 | -------- | -------- | -------- |
| Sail | -------- | -------- | -------- | 1 | 74 | 9 | 1 | -------- |
| Net tonnage | -------- | -------- | -------- | 32 | 954 | 68 | 25 | -------- |
| Total vessels | -------- | -------- | -------- | 1 | 76 | 9 | 1 | -------- |
| Total net tonnage | -------- | -------- | -------- | 32 | 966 | 68 | 25 | -------- |
| Boats: | | | | | | | | |
| Motor | 267 | 5 | 209 | 269 | 161 | 391 | 131 | 143 |
| Other | 57 | 13 | 42 | 226 | 596 | 57 | 49 | 143 |
| Apparatus: | | | | | | | | |
| Haul seines | 27 | 9 | 17 | 8 | 5 | 2 | 1 | 1 |
| Length, yards | 4,635 | 1,105 | 2,610 | 2,220 | 50 | 450 | 500 | 130 |
| Gill nets: | | | | | | | | |
| Anchor | 254 | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Square yards | 32,712 | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Drift | 22 | 1 | 3 | -------- | 9 | 12 | 63 | 21 |
| Square yards | 39,231 | 2,500 | 2,000 | -------- | 3,972 | 9,183 | 39,083 | 5,880 |
| Stake | 1,026 | 2 | 3 | -------- | 88 | 11 | 225 | 101 |
| Square yards | 123,340 | 40 | 750 | -------- | 2,088 | 522 | 7,588 | 10,130 |
| Lines: | | | | | | | | |
| Hand | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 100 |
| Hooks | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 120 |
| Trot with baits or snoods | 137 | -------- | 81 | 128 | 139 | 223 | 4 | 103 |
| Baits or snoods | 102,800 | -------- | 64,800 | 101,900 | 105,200 | 162,600 | 3,200 | 82,000 |
| Pound nets | 29 | -------- | 4 | 78 | 33 | 87 | 26 | 40 |
| Fyke nets | 238 | 60 | 45 | -------- | 11 | 27 | 6 | 27 |
| Dip nets | -------- | -------- | 32 | 135 | 256 | 19 | -------- | 43 |
| Pots: | | | | | | | | |
| Crab | -------- | -------- | -------- | -------- | 55 | -------- | -------- | -------- |
| Eel | 1,212 | 35 | 2,245 | 12 | 35 | 4,943 | 25 | -------- |
| Fish | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 200 |
| Scrapes | -------- | -------- | -------- | -------- | 614 | -------- | -------- | -------- |
| Yards at mouth | -------- | -------- | -------- | -------- | 614 | -------- | -------- | -------- |
| Dredges, oyster | -------- | -------- | -------- | 2 | 190 | 18 | 2 | 58 |
| Yards at mouth | -------- | -------- | -------- | 3 | 235 | 21 | 3 | 42 |
| Tongs: | | | | | | | | |
| Oyster | 334 | -------- | 492 | 581 | 162 | 468 | 303 | 31 |
| Other | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 64 |
| Rakes, oyster | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 56 |

### CATCH: BY COUNTIES

| Species | Anne Arundel | | Baltimore | | Calvert | | Caroline | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 817,900 | $8,978 | 30,400 | $408 | 334,500 | $3,835 | 12,100 | $510 |
| Black bass | 100 | 15 | 200 | 21 | 100 | 10 | 1,000 | 105 |
| Bluefish | 5,300 | 370 | -------- | -------- | 700 | 56 | -------- | -------- |
| Butterfish | 4,200 | 356 | -------- | -------- | -------- | -------- | -------- | -------- |
| Carp | 5,300 | 306 | 2,300 | 99 | 5,100 | 236 | 7,700 | 500 |
| Catfish and bullheads | 15,200 | 481 | 20,600 | 574 | 13,000 | 391 | 14,300 | 429 |
| Crappie | 300 | 6 | -------- | -------- | -------- | -------- | 100 | 4 |
| Croaker | 264,300 | 6,224 | 100 | 4 | 37,500 | 523 | 2,500 | 75 |
| Drum: | | | | | | | | |
| Black | -------- | -------- | -------- | -------- | 300 | 3 | -------- | -------- |
| Red or redfish | 100 | 2 | -------- | -------- | 100 | 1 | -------- | -------- |
| Eels, common | 12,100 | 917 | 7,200 | 591 | -------- | -------- | 200 | 12 |
| Flounders | 3,700 | 250 | 700 | 15 | 1,700 | 85 | -------- | -------- |
| Gizzard shad | 11,200 | 158 | 9,200 | 142 | 600 | 14 | 3,700 | 110 |
| Hickory shad | 3,600 | 64 | -------- | -------- | 2,200 | 35 | -------- | -------- |
| Menhaden | 2,800 | 28 | -------- | -------- | -------- | -------- | -------- | -------- |

## *Fisheries of Maryland, 1938*—Continued

### CATCH: BY COUNTIES—Continued

| Species | Anne Arundel | | Baltimore | | Calvert | | Caroline | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Pike or pickerel | 1,500 | $225 | 500 | $90 | 200 | $30 | 200 | $24 |
| Shad | 38,100 | 3,532 | 300 | 26 | 62,900 | 7,738 | 4,100 | 595 |
| Spanish mackerel | 4,200 | 374 | | | | | | |
| Spot | 21,600 | 699 | 400 | 8 | 1,000 | 15 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 428,100 | 13,925 | 1,600 | 124 | 7,000 | 210 | 1,100 | 55 |
| Spotted | 300 | 30 | | | 400 | 38 | | |
| Striped bass | 202,700 | 16,936 | 20,000 | 1,899 | 40,100 | 3,871 | 112,700 | 7,361 |
| Suckers | 100 | 3 | | | | | 800 | 33 |
| Sunfish | 100 | 3 | | | | | | |
| White perch | 30,500 | 1,330 | 26,100 | 1,074 | 4,200 | 251 | 78,300 | 2,601 |
| Yellow perch | 5,300 | 504 | 12,000 | 605 | 2,900 | 175 | 13,700 | 732 |
| Crabs: | | | | | | | | |
| Hard | 575,200 | 13,806 | 136,900 | 4,107 | 535,700 | 14,392 | | |
| Soft and peelers | 29,300 | 3,674 | 10,500 | 1,306 | 62,500 | 8,649 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 564,200 | 37,616 | 74,400 | 4,340 | 237,500 | 15,701 | | |
| Public, fall | 1,010,000 | 67,333 | 177,000 | 10,325 | 673,500 | 44,547 | | |
| Private, spring | | | | | 67,700 | 4,583 | | |
| Private, fall | | | | | 192,000 | 13,150 | | |
| Total | 4,057,300 | 178,145 | 530,400 | 25,758 | 2,283,400 | 118,539 | 252,500 | 13,146 |

| Species | Cecil | | Charles | | Dorchester | | Harford | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 681,900 | $3,514 | 86,200 | $722 | 327,000 | $3,673 | 163,200 | $1,470 |
| Black bass | 64,200 | 6,016 | 8,300 | 806 | 500 | 44 | 16,700 | 2,334 |
| Bluefish | | | | | 12,900 | 1,187 | | |
| Butterfish | | | | | 1,900 | 101 | | |
| Carp | 29,900 | 1,696 | 93,300 | 5,411 | 7,500 | 217 | 53,200 | 3,767 |
| Catfish and bullheads | 89,500 | 3,152 | 110,900 | 3,632 | 32,800 | 969 | 49,300 | 1,553 |
| Crappie | 800 | 42 | 200 | 20 | 300 | 28 | 600 | 20 |
| Croaker | | | 3,700 | 119 | 207,300 | 3,797 | 600 | 18 |
| Drum: | | | | | | | | |
| Black | | | | | 1,000 | 10 | | |
| Red or redfish | | | | | 1,900 | 29 | | |
| Eels, common | 18,500 | 1,379 | 1,000 | 86 | 33,300 | 2,164 | 6,600 | 595 |
| Flounders | | | | | 16,600 | 690 | | |
| Gizzard shad | 5,300 | 37 | 74,400 | 774 | 7,900 | 92 | 2,000 | 20 |
| Hickory shad | 1,700 | 35 | 100 | 2 | 3,500 | 69 | 400 | 18 |
| Menhaden | | | | | 60,000 | 300 | | |
| Pike or pickerel | 17,300 | 2,210 | 2,200 | 367 | 1,000 | 152 | 15,600 | 2,707 |
| Shad | 37,000 | 2,832 | 16,200 | 1,642 | 45,100 | 4,788 | 16,600 | 1,445 |
| Spot | | | | | 2,300 | 90 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | | | 21,900 | 861 | | |
| Spotted | | | | | 900 | 65 | | |
| Striped bass | 45,400 | 3,607 | 95,300 | 7,114 | 328,400 | 24,652 | 47,300 | 4,015 |
| Suckers | 2,500 | 111 | | | | | | |
| Sunfish | 3,500 | 92 | | | 300 | 16 | 5,100 | 70 |
| White perch | 32,800 | 1,156 | 17,100 | 614 | 76,900 | 2,601 | 13,000 | 579 |
| Yellow perch | 50,500 | 2,517 | 16,000 | 1,387 | 1,100 | 54 | 24,300 | 1,308 |
| Crabs: | | | | | | | | |
| Hard | | | 833,200 | 21,629 | 7,655,800 | 130,151 | | |
| Soft and peelers | | | 13,000 | 1,160 | 183,000 | 14,527 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | | | 98,100 | 5,125 | 1,221,000 | 78,706 | | |
| Public, fall | | | 227,000 | 11,754 | 2,407,400 | 156,438 | | |
| Private, spring | | | 8,000 | 600 | | | | |
| Private, fall | | | 64,400 | 4,836 | | | | |
| Terrapin, diamond-back | | | | | 2,100 | 1,779 | | |
| Turtle snapper | 600 | 36 | | | | | | |
| Total | 1,081,400 | 28,432 | 1,768,600 | 67,800 | 12,661,600 | 428,250 | 414,500 | 19,919 |

## *Fisheries of Maryland, 1938*—Continued

### CATCH: By counties—Continued

| Species | Kent | | Prince Georges | | Queen Annes | | St. Marys | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 206,400 | $2,299 | 200 | $10 | 11,000 | $178 | 641,600 | $7,066 |
| Black bass | 1,500 | 146 | 800 | 80 | | | | |
| Bluefish | 3,100 | 310 | | | | | 1,800 | 144 |
| Butterfish | 2,500 | 250 | | | | | 600 | 59 |
| Carp | 4,100 | 155 | 55,100 | 3,193 | 10,800 | 569 | 4,400 | 137 |
| Catfish and bullheads | 37,900 | 1,325 | 49,400 | 1,718 | 26,600 | 1,088 | 9,700 | 286 |
| Crappie | | | 200 | 16 | | | | |
| Croaker | 109,800 | 2,664 | 200 | 20 | 15,400 | 421 | 65,900 | 1,471 |
| Drum: | | | | | | | | |
| Black | | | | | | | 700 | 11 |
| Red or redfish | | | | | | | 300 | 5 |
| Eels, common | 9,800 | 935 | 2,100 | 210 | 25,000 | 2,591 | 400 | 35 |
| Flounders | 1,100 | 65 | | | | | 4,800 | 308 |
| Gizzard shad | 7,100 | 191 | 800 | 10 | 1,800 | 34 | 5,000 | 105 |
| Hickory shad | 100 | 3 | | | | | 5,900 | 146 |
| Mullet | | | | | 200 | 8 | 100 | 3 |
| Pike or pickerel | 3,200 | 470 | 300 | 45 | | | 1,500 | 180 |
| Shad | 29,500 | 2,828 | 7,100 | 699 | | | 152,900 | 15,922 |
| Spanish mackerel | 4,300 | 194 | | | | | 100 | 10 |
| Spot | 19,300 | 404 | | | | | 3,300 | 107 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 132,300 | 5,949 | | | | | 54,000 | 1,778 |
| Spotted | 3,300 | 340 | 300 | 30 | | | 900 | 70 |
| Striped bass | 359,100 | 32,512 | 3,100 | 310 | 35,100 | 3,162 | 107,300 | 8,828 |
| Suckers | | | 400 | 18 | 400 | 35 | | |
| White perch | 61,200 | 2,352 | 6,300 | 225 | 24,100 | 1,113 | 16,500 | 655 |
| Yellow perch | 24,600 | 1,492 | 600 | 33 | 19,700 | 1,236 | 10,600 | 425 |
| Crabs: | | | | | | | | |
| Hard | 472,300 | 14,168 | | | 866,200 | 21,654 | 1,117,500 | 27,937 |
| Soft and peelers | 13,400 | 2,155 | | | 34,200 | 4,384 | 95,100 | 13,597 |
| Oysters, market: | | | | | | | | |
| Public, spring | 282,300 | 14,316 | | | 589,300 | 29,460 | 450,900 | 24,793 |
| Public, fall | 791,800 | 43,187 | | | 2,310,900 | 115,544 | 661,100 | 36,054 |
| Private, spring | | | | | | | 40,000 | 2,500 |
| Private, fall | | | | | | | 112,000 | 7,000 |
| Total | 2,580,000 | 128,650 | 126,900 | 6,617 | 3,970,700 | 181,477 | 3,564,900 | 149,632 |

| Species | Somerset | | Talbot | | Wicomico | | Worcester | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 80,400 | $889 | 1,943,800 | $17,032 | 59,300 | $631 | 700 | $13 |
| Bluefish | 2,700 | 197 | 2,100 | 192 | | | 22,600 | 2,255 |
| Bonito | | | | | | | 6,900 | 295 |
| Butterfish | 600 | 30 | 600 | 45 | 1,500 | 75 | 53,000 | 1,990 |
| Cabio or crab eater | | | | | | | 100 | 5 |
| Carp | 300 | 11 | 3,400 | 122 | 2,600 | 86 | | |
| Catfish and bullheads | 5,900 | 285 | 18,300 | 524 | 23,800 | 744 | | |
| Croaker | 128,200 | 1,484 | 185,100 | 2,561 | 114,100 | 1,853 | 1,890,200 | 18,910 |
| Drum: | | | | | | | | |
| Black | | | 2,000 | 25 | | | 5,000 | 50 |
| Red or redfish | 100 | 5 | | | | | | |
| Eels: | | | | | | | | |
| Common | 1,800 | 93 | 10,800 | 502 | 1,900 | 138 | 3,000 | 200 |
| Conger | | | | | | | 200 | 2 |
| Flounders | 3,900 | 208 | 1,700 | 84 | 2,200 | 212 | 29,500 | 1,535 |
| Gizzard shad | 2,100 | 23 | 100 | 1 | 3,900 | 82 | | |
| Harvestfish | | | | | 500 | 24 | 1,000 | 30 |
| Hickory shad | 200 | 4 | 7,300 | 141 | 100 | 4 | 1,000 | 20 |
| Hogchoker | 2,000 | 70 | | | | | | |
| King whiting or "kingfish" | | | | | 200 | 20 | 3,500 | 175 |
| Mackerel | | | | | | | 2,500 | 250 |
| Mullet | | | | | | | 3,300 | 159 |
| Pike or pickerel | | | 200 | 20 | 200 | 20 | | |
| Scup | | | | | | | 22,000 | 270 |
| Sea bass | | | | | | | 42,000 | 1,680 |
| Shad | 16,300 | 1,986 | 133,500 | 12,452 | 29,400 | 3,411 | 10,700 | 1,239 |
| Spanish mackerel | | | 800 | 95 | | | 11,000 | 605 |
| Spot | | | 3,600 | 110 | 3,000 | 60 | 5,400 | 150 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 16,600 | 366 | 217,200 | 7,280 | 15,800 | 738 | 173,500 | 3,861 |
| Spotted | 100 | 10 | 1,000 | 84 | 1,000 | 100 | | |
| Striped bass | 15,300 | 1,216 | 198,400 | 15,379 | 96,600 | 8,636 | 7,600 | 772 |
| Sturgeon | | | | | 100 | 14 | | |
| Suckers | | | | | 300 | 9 | | |
| Tautog | | | | | | | 500 | 17 |

### *Fisheries of Maryland, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Somerset | | Talbot | | Wicomico | | Worcester | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| White perch | 5,200 | $237 | 27,200 | $1,242 | 9,600 | $467 | 7,600 | $600 |
| Yellow perch | --- | --- | 10,000 | 861 | 1,200 | 65 | --- | --- |
| Crabs: | | | | | | | | |
| Hard | 2,717,800 | $52,106 | 3,957,400 | $53,318 | 32,800 | $492 | 1,798,300 | $31,470 |
| Soft and peelers | 2,346,400 | 164,923 | 23,800 | 2,338 | 1,200 | 96 | 86,000 | 7,951 |
| Lobsters | --- | --- | --- | --- | --- | --- | 100 | 20 |
| Clams, hard, public | --- | --- | --- | --- | --- | --- | 53,400 | 10,020 |
| Oysters, market: | | | | | | | | |
| Public, spring | 997,800 | 58,205 | 675,900 | 39,547 | 108,900 | 6,350 | --- | --- |
| Public, fall | 1,972,100 | 113,786 | 1,932,800 | 112,746 | 600,700 | 29,207 | --- | --- |
| Private, spring | 40,000 | 3,002 | --- | --- | 15,400 | 1,158 | 329,900 | 53,936 |
| Private, fall | 86,400 | 6,470 | --- | --- | 84,600 | 6,339 | 258,000 | 39,505 |
| Squid | --- | --- | --- | --- | --- | --- | 130,000 | 1,300 |
| Terrapin, diamond-back | 2,400 | 800 | --- | --- | --- | --- | --- | --- |
| Total | 8,444,600 | 406,406 | 9,357,000 | 266,701 | 1,210,900 | 61,031 | 4,958,500 | 179,285 |

## VIRGINIA

### *Fisheries of Virginia, 1938*

OPERATING UNITS: BY GEAR

| Item | Purse seines menhaden | Haul seines | Gill nets | | | Lines, hand |
|---|---|---|---|---|---|---|
| | | | Drift | Run-around | Stake | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 1,271 | --- | --- | --- | --- | --- |
| On boats and shore: | | | | | | |
| Regular | --- | 285 | 14 | 12 | 76 | 15 |
| Casual | --- | 204 | 320 | 9 | 152 | 22 |
| Total | 1,271 | 489 | 334 | 21 | 228 | 37 |
| Vessels: | | | | | | |
| Steam | 25 | --- | --- | --- | --- | --- |
| Net tonnage | 2,880 | --- | --- | --- | --- | --- |
| Motor | 8 | --- | --- | --- | --- | --- |
| Net tonnage | 765 | --- | --- | --- | --- | --- |
| Total vessels | 33 | --- | --- | --- | --- | --- |
| Total net tonnage | 3,645 | --- | --- | --- | --- | --- |
| Boats: | | | | | | |
| Motor | --- | 90 | 25 | 6 | 87 | 14 |
| Other | --- | 198 | 199 | 6 | 139 | 2 |
| Accessory boats | 99 | --- | --- | --- | --- | --- |
| Apparatus: | | | | | | |
| Number | 33 | 148 | 234 | 10 | 4,863 | 300 |
| Length, yards | 10,890 | 63,888 | --- | --- | --- | --- |
| Square yards | --- | --- | 206,751 | 5,369 | 222,870 | --- |
| Hooks, baits, or snoods | --- | --- | --- | --- | --- | 400 |

| Item | Lines—Continued | | Pound nets | Fyke nets | | Dip nets | Otter trawls |
|---|---|---|---|---|---|---|---|
| | Trot with baits or snoods | Trot with hooks | | Crab | Fish | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | --- | --- | --- | --- | --- | --- | 132 |
| On boats and shore: | | | | | | | |
| Regular | 1,233 | 1 | 1,697 | 106 | 77 | 416 | --- |
| Casual | 373 | 5 | 306 | 31 | 102 | 538 | --- |
| Total | 1,606 | 6 | 2,003 | 137 | 179 | 954 | 132 |
| Vessels, motor | --- | --- | --- | --- | --- | --- | 28 |
| Net tonnage | --- | --- | --- | --- | --- | --- | 573 |
| Boats: | | | | | | | |
| Motor | 1,153 | --- | 337 | 97 | 46 | 50 | --- |
| Other | 450 | 6 | 588 | 52 | 90 | 894 | --- |
| Apparatus: | | | | | | | |
| Number | 1,603 | 6 | 1,871 | 408 | 621 | 954 | 28 |
| Yards at mouth | --- | --- | --- | --- | --- | --- | 776 |
| Hooks, baits, or snoods | 928,900 | 1,600 | --- | --- | --- | --- | --- |

## *Fisheries of Virginia, 1938*—Continued

### OPERATING UNITS: BY GEAR—Continued

| Item | Slat traps | Pots | | | | Scrapes | Dredges | |
|---|---|---|---|---|---|---|---|---|
| | | Crab | Eel | Fish | Turtle | | Crab | Oyster |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | | | | 311 | 126 |
| On boats and shore: | | | | | | | | |
| Regular | | 35 | 9 | 6 | | 127 | 100 | 10 |
| Casual | 5 | 6 | 11 | 13 | 3 | | | |
| Total | 5 | 41 | 20 | 19 | 3 | 127 | 411 | 136 |
| Vessels, motor | | | | | | | 98 | 29 |
| Net tonnage | | | | | | | 1,011 | 401 |
| Boats: | | | | | | | | |
| Motor | | 31 | 6 | 5 | | 117 | 50 | 5 |
| Other | 4 | 11 | 13 | 11 | 3 | | | |
| Apparatus: | | | | | | | | |
| Number | 5 | 740 | 734 | 245 | 35 | 170 | 296 | 67 |
| Yards at mouth | | | | | | 194 | 485 | 108 |

| Item | Tongs | | Rakes | | Picks | By hand | | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| | Oyster | Other | Oyster | Other | | Oyster | Other | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 6 | | | | | | | 1,789 |
| On boats and shore: | | | | | | | | |
| Regular | 1,772 | 227 | 172 | 241 | 100 | 204 | 666 | 4,217 |
| Casual | 638 | 19 | 20 | | | | 177 | 2,834 |
| Total | 2,416 | 246 | 192 | 241 | 100 | 204 | 843 | 8,840 |
| Vessels: | | | | | | | | |
| Steam | | | | | | | | 25 |
| Net tonnage | | | | | | | | 2,880 |
| Motor | 3 | | | | | | | 149 |
| Total net tonnage | 20 | | | | | | | 2,598 |
| Total vessels | 3 | | | | | | | 174 |
| Total net tonnage | 20 | | | | | | | 5,478 |
| Boats: | | | | | | | | |
| Motor | 1,303 | 167 | 73 | 32 | 35 | 81 | 124 | 3,324 |
| Other | 304 | 95 | 152 | 241 | 100 | 204 | 427 | 3,687 |
| Accessory boats | | | | | | | | 99 |
| Apparatus, number | 2,098 | 241 | 192 | 241 | 100 | | | |

### CATCH: BY GEAR

| Species | Purse seines | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Drift | | Runaround | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 100,700 | $1,289 | 12,500 | $237 | | |
| Bluefish | | | 75,200 | 3,843 | 1,200 | 60 | 100 | $5 |
| Butterfish | | | 96,300 | 794 | | | | |
| Cabio or crab eater | | | 200 | 10 | | | | |
| Carp | | | 462,000 | 30,326 | 2,700 | 81 | | |
| Catfish and bullheads | | | 106,200 | 4,470 | | | 700 | 35 |
| Croaker | | | 4,635,900 | 55,602 | 26,700 | 437 | 39,000 | 575 |
| Drum, red or redfish | | | 23,300 | 311 | | | | |
| Eels, common | | | 25,300 | 2,502 | | | | |
| Flounders | | | 28,900 | 1,147 | | | | |
| Gizzard shad | | | 141,700 | 2,001 | 300 | 6 | 20,000 | 300 |
| Harvestfish | | | 40,000 | 600 | | | | |
| Hickory shad | | | 200 | 6 | 1,200 | 50 | | |
| King whiting or "kingfish" | | | 59,200 | 2,390 | | | | |
| Menhaden | 93,612,000 | $358,798 | | | | | | |
| Mullet | | | 1,600 | 64 | 2,500 | 150 | 2,600 | 84 |

## *Fisheries of Virginia, 1938*—Continued

### CATCH: By gear—Continued

| Species | Purse seines | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Drift | | Runaround | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Pike or pickerel | -------- | -- | 1,300 | $242 | -------- | -------- | -------- | -------- |
| Shad | -------- | -------- | 5,300 | 495 | 205,500 | $19,335 | -------- | -------- |
| Sharks | -------- | -------- | 86,400 | 864 | -------- | -------- | -------- | -------- |
| Skates | -------- | -------- | 2,400 | 82 | -------- | -------- | -------- | -------- |
| Spanish mackerel | -------- | -------- | 4,600 | 337 | -------- | -------- | -------- | -------- |
| Spot | -------- | -------- | 2,188,000 | 40,760 | 27,000 | 918 | 5,300 | $106 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | -------- | -------- | 325,100 | 5,997 | 4,500 | 224 | 500 | 20 |
| Spotted | -------- | -------- | 356,500 | 29,313 | 100 | 10 | -------- | -------- |
| Striped bass | -------- | -------- | 105,900 | 8,246 | 6,500 | 512 | -------- | -------- |
| Swellfish | -------- | -------- | 2,200 | 25 | -------- | -------- | -------- | -------- |
| White perch | -------- | -------- | 33,100 | 1,140 | -------- | -------- | 500 | 15 |
| Yellow perch | -------- | -------- | 11,200 | 472 | -------- | -------- | -------- | -------- |
| Crabs, soft and peelers | -------- | -------- | 17,700 | 2,480 | -------- | -------- | -------- | -------- |
| Total | 93,612,000 | $358,798 | 8,936,400 | 195,808 | 290,700 | 22,020 | 68,700 | 1,140 |

| Species | Gill nets—Con. | | Lines | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Stake | | Hand | | Trot with baits or snoods | | Trot with hooks | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 900 | $21 | -------- | -------- | -------- | -------- | -------- | -------- |
| Bluefish | -------- | -------- | 30,000 | $3,000 | -------- | -------- | -------- | -------- |
| Cabio or crab eater | -------- | -------- | 100 | 7 | -------- | -------- | -------- | -------- |
| Carp | -------- | -------- | -------- | -------- | -------- | -------- | 2,300 | $69 |
| Catfish and bullheads | 500 | 20 | -------- | -------- | -------- | -------- | 2,000 | 70 |
| Croaker | -------- | -------- | 16,000 | 480 | -------- | -------- | -------- | -------- |
| Eels, common | -------- | -------- | -------- | -------- | -------- | -------- | 200 | 14 |
| Flounders | -------- | -------- | 4,000 | 320 | -------- | -------- | -------- | -------- |
| King whiting or "kingfish" | - | --- | 800 | 48 | -------- | -------- | -------- | -------- |
| Scup | -------- | -------- | 30,000 | 600 | -------- | -------- | -------- | -------- |
| Sea bass | -------- | -------- | 70,000 | 2,800 | -------- | -------- | -------- | -------- |
| Shad | 125,100 | 13,864 | -------- | -------- | -------- | -------- | -------- | -------- |
| Spanish mackerel | -------- | -------- | 2,000 | 160 | -------- | -------- | -------- | -------- |
| Squeteagues or "sea trout," gray | -------- | -------- | 80,000 | 8,000 | -------- | -------- | -------- | -------- |
| Striped bass | 205,100 | 18,076 | -------- | -------- | -------- | -------- | 500 | 50 |
| White perch | 1,600 | 128 | -------- | -------- | -------- | -------- | -------- | -------- |
| Crabs: | | | | | | | | |
| Hard | -------- | -------- | -------- | -------- | 22,434,000 | $324,614 | -------- | -------- |
| Soft and peelers | -------- | -------- | -------- | -------- | 506,000 | 36,113 | -------- | -------- |
| Turtle, snapper | -------- | -------- | 3,500 | 140 | -------- | -------- | -------- | -------- |
| Total | 333,200 | 32,109 | 236,400 | 15,555 | 22,940,000 | 360,727 | 5,000 | 203 |

| Species | Pound nets | | Fyke nets | | | | Dip nets | |
|---|---|---|---|---|---|---|---|---|
| | | | Crab | | Fish | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 17,504,900 | $161,386 | -------- | ---- | 58,500 | $856 | -------- | -------- |
| Bluefish | 193,700 | 10,320 | -------- | -------- | 100 | 10 | -------- | -------- |
| Bonito | 34,800 | 1,044 | -------- | -------- | -------- | -------- | -------- | -------- |
| Butterfish | 2,850,900 | 36,216 | -------- | -------- | -------- | -------- | -------- | -------- |
| Cabio or crab eater | 22,400 | 1,044 | -------- | -------- | -------- | -------- | -------- | -------- |
| Carp | 27,500 | 730 | 2,100 | $48 | 41,100 | 1,849 | -------- | -------- |
| Catfish and bullheads | 177,900 | 6,889 | 16,300 | 815 | 231,300 | 8,871 | -------- | -------- |
| Croaker | 33,080,800 | 407,019 | -------- | -------- | 43,600 | 850 | -------- | -------- |
| Drum: | | | | | | | | |
| Black | 116,700 | 1,022 | -------- | -------- | -------- | -------- | -------- | -------- |
| Red or redfish | 78,800 | 995 | -------- | -------- | 500 | 7 | -------- | -------- |
| Eels, common | 78,300 | 9,166 | 300 | 27 | 3,600 | 282 | -------- | -------- |
| Flounders | 298,200 | 12,293 | -------- | -------- | 2,600 | 133 | -------- | -------- |
| Gizzard shad | 166,600 | 1,765 | 500 | 10 | 97,400 | 1,148 | -------- | -------- |
| Harvestfish | 448,500 | 7,693 | -------- | -------- | -------- | -------- | -------- | -------- |
| Hickory shad | 135,600 | 2,505 | -------- | -------- | 2,500 | 61 | -------- | -------- |
| King whiting or "kingfish" | 101,700 | 4,689 | -------- | -------- | -------- | -------- | -------- | -------- |
| Mackerel | 12,300 | 438 | -------- | -------- | -------- | -------- | -------- | -------- |
| Menhaden | 1,408,500 | 2,150 | -------- | -------- | -------- | -------- | -------- | -------- |

### *Fisheries of Virginia, 1938*—Continued

CATCH: BY GEAR—Continued

| Species | Pound nets | | Fyke nets | | | | Dip nets | |
|---|---|---|---|---|---|---|---|---|
| | | | Crab | | Fish | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Mullet | 13, 800 | $546 | | | | | | |
| Pike or pickerel | 200 | 30 | | | 700 | $98 | | |
| Scup | 12, 500 | 200 | | | | | | |
| Sea bass | 1, 100 | 44 | | | | | | |
| Shad | 3, 242, 100 | 296, 598 | | | 29, 400 | 2, 496 | | |
| Sharks | 10, 700 | 105 | | | | | | |
| Skates | 6, 200 | 33 | | | | | | |
| Spanish mackerel | 430, 400 | 29, 039 | | | | | | |
| Spot | 1, 601, 200 | 29, 218 | | | 900 | 21 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 10, 577, 400 | 169, 890 | | | 25, 700 | 747 | | |
| Spotted | 36, 900 | 2, 985 | | | 100 | 9 | | |
| Striped bass | 774, 400 | 59, 001 | 200 | $14 | 62, 400 | 5, 394 | | |
| Sturgeon | 9, 400 | 1, 460 | | | | | | |
| Swellfish | 21, 600 | 478 | | | | | | |
| White perch | 167, 500 | 4, 533 | 4, 700 | 141 | 80, 500 | 2, 822 | | |
| Whiting | 1, 200 | 36 | | | | | | |
| Yellow perch | 4, 600 | 310 | 300 | 24 | 36, 500 | 2, 463 | | |
| Crabs: | | | | | | | | |
| Hard | 100, 700 | 1, 058 | 49, 900 | 1, 207 | | | 172, 500 | $3, 019 |
| Soft and peelers | | | 206, 300 | 27, 873 | | | 677, 300 | 59, 762 |
| Shrimp | 8, 000 | 980 | | | | | | |
| Squid | 165, 900 | 1, 842 | | | | | | |
| Total | 73, 923, 900 | 1, 265, 750 | 280, 600 | 30, 159 | 717, 400 | 28, 120 | 849, 800 | 62, 781 |

| Species | Otter trawls | | Slat traps | | Pots | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Crab | | Eel | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 400 | $3 | 13, 000 | $265 | | | | |
| Bluefish | 2, 800 | 176 | | | | | | |
| Butterfish | 192, 800 | 4, 950 | | | | | | |
| Carp | | | 1, 500 | 48 | | | | |
| Catfish and bullheads | | | 700 | 36 | | | | |
| Cod | 400 | 13 | | | | | | |
| Croaker | 5, 442, 500 | 93, 856 | | | | | | |
| Drum: | | | | | | | | |
| Black | 100 | 2 | | | | | | |
| Red or redfish | 31, 000 | 476 | | | | | | |
| Eels: | | | | | | | | |
| Common | | | | | | | 48, 700 | $4, 726 |
| Conger | 3, 700 | 45 | | | | | | |
| Flounders | 438, 400 | 28, 436 | | | | | | |
| Hake | 12, 100 | 179 | | | | | | |
| Hickory shad | 100 | 1 | 800 | 28 | | | | |
| Hogfish | 400 | 8 | | | | | | |
| King whiting or "kingfish" | 99, 300 | 3, 795 | | | | | | |
| Mackerel | 5, 100 | 451 | | | | | | |
| Mullet | 2, 900 | 101 | | | | | | |
| Pollock | 100 | 1 | | | | | | |
| Sand perch | 7, 300 | 97 | | | | | | |
| Scup | 2, 301, 300 | 37, 450 | | | | | | |
| Sea bass | 230, 500 | 10, 163 | | | | | | |
| Sea robin | 3, 000 | 30 | | | | | | |
| Shad | 200 | 11 | | | | | | |
| Sharks | 140, 200 | 1, 787 | | | | | | |
| Spot | 43, 400 | 851 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 1, 534, 200 | 40, 987 | | | | | | |
| Spotted | 100 | 5 | | | | | | |
| Sturgeon | 6, 300 | 776 | | | | | | |
| Swellfish | 10, 000 | 277 | | | | | | |
| Tautog | 1, 100 | 18 | | | | | | |
| Tomcod | 7, 400 | 79 | | | | | | |
| White perch | 2, 100 | 26 | 200 | 12 | | | | |
| Whiting | 138, 300 | 2, 534 | | | | | | |
| Crabs, hard | | | | | 251, 700 | $4, 450 | | |
| Lobsters | 1, 400 | 157 | | | | | | |
| Squid | 67, 100 | 1, 009 | | | | | | |
| Total | 10, 726, 000 | 228, 750 | 16, 200 | 389 | 251, 700 | 4, 450 | 48, 700 | 4, 726 |

## *Fisheries of Virginia, 1938*—Continued

### CATCH: By gear—Continued

| Species | Pots—Continued |  |  |  | Scrapes |  | Dredges |  |
|---|---|---|---|---|---|---|---|---|
|  | Fish |  | Turtle |  |  |  |  |  |
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Catfish and bullheads | 128, 600 | $5, 238 |  |  |  |  |  |  |
| Eels, common | 5, 300 | 281 |  |  |  |  |  |  |
| Crabs: |  |  |  |  |  |  |  |  |
| Hard |  |  |  |  | 280, 000 | $3, 820 | 5, 391, 600 | $147, 780 |
| Soft and peelers |  |  |  |  | 542, 300 | 34, 971 |  |  |
| Oysters, market: |  |  |  |  |  |  |  |  |
| Private, spring |  |  |  |  | 46, 000 | 4, 500 | 1, 482, 600 | 127, 719 |
| Private, fall |  |  |  |  | 48, 200 | 4, 580 | 2, 992, 800 | 225, 280 |
| Turtle, snapper |  |  | 7, 100 | $850 |  |  |  |  |
| Total | 133, 900 | 5, 519 | 7, 100 | 850 | 916, 500 | 47, 871 | 9, 867, 000 | 500, 779 |

| Species | Tongs |  | Rakes |  | Picks |  | By hand |  |
|---|---|---|---|---|---|---|---|---|
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs: |  |  |  |  |  |  |  |  |
| Hard |  |  |  |  |  |  | 10, 000 | $150 |
| Soft and peelers |  |  |  |  |  |  | 833, 000 | 49, 980 |
| Clams: |  |  |  |  |  |  |  |  |
| Hard, public | 984, 500 | $92, 548 | 344, 000 | $47, 080 | 420, 000 | $78, 750 | 1, 009, 300 | 151, 670 |
| Hard, private | 52, 200 | 5, 000 |  |  |  |  |  |  |
| Soft, public |  |  |  |  |  |  | 2, 500 | 1, 000 |
| Mussels, sea |  |  |  |  |  |  | 30, 000 | 900 |
| Oysters, market: |  |  |  |  |  |  |  |  |
| Public, spring | 1, 562, 700 | 138, 645 |  |  |  |  | 48, 500 | 3, 210 |
| Public, fall | 2, 684, 800 | 238, 856 |  |  |  |  | 67, 000 | 5, 740 |
| Private, spring | 1, 157, 300 | 102, 780 | 618, 500 | 47, 525 |  |  | 202, 300 | 14, 799 |
| Private, fall | 1, 722, 800 | 156, 041 | 1, 093, 100 | 74, 815 |  |  | 322, 700 | 27, 020 |
| Terrapin, diamond-back |  |  |  |  |  |  | 4, 300 | 150 |
| Total | 8, 164, 300 | 733, 870 | 2, 055, 600 | 169, 420 | 420, 000 | 78, 750 | 2, 529, 600 | 254, 619 |

### OPERATING UNITS: By counties

| Item | Accomac | Caroline | Charles City | Chesterfield | Dinwiddie | Elizabeth City | Essex | Fairfax |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 12 |  |  |  |  | 116 |  |  |
| On boats and shore: |  |  |  |  |  |  |  |  |
| Regular | 1, 014 |  | 4 | 13 |  | 182 | 67 | 2 |
| Casual | 262 | 6 | 77 | 45 | 4 | 19 | 51 | 60 |
| Total | 1, 288 | 6 | 81 | 58 | 4 | 317 | 118 | 62 |
| Vessels, motor | 3 |  |  |  |  | 26 |  |  |
| Net tonnage | 52 |  |  |  |  | 443 |  |  |
| Boats: |  |  |  |  |  |  |  |  |
| Motor | 791 |  | 3 | 1 |  | 63 | 53 | 22 |
| Other | 741 | 3 | 58 | 26 | 3 | 30 | 26 | 26 |
| Apparatus: |  |  |  |  |  |  |  |  |
| Haul seines | 14 |  | 5 | 11 |  |  | 6 | 8 |
| Length, yards | 8, 770 |  | 1, 600 | 4, 750 |  |  | 1, 250 | 1, 800 |
| Gill nets: |  |  |  |  |  |  |  |  |
| Drift | 2 | 3 | 57 | 13 | 1 |  |  | 15 |
| Square yards | 900 | 2, 250 | 61, 000 | 10, 650 | 500 |  |  | 12, 000 |
| Stake | 60 |  |  |  |  |  | 170 |  |
| Square yards | 1, 440 |  |  |  |  |  | 5, 181 |  |
| Lines: |  |  |  |  |  |  |  |  |
| Hand | 100 |  |  |  |  |  |  |  |
| Hooks | 200 |  |  |  |  |  |  |  |
| Trot with baits or snoods | 394 |  |  |  |  | 30 | 7 |  |
| Baits or snoods | 233, 700 |  |  |  |  | 18, 800 | 1, 600 |  |
| Trot with hooks |  |  |  | 2 |  |  | 1 |  |
| Hooks |  |  |  | 600 |  |  | 300 |  |
| Pound nets | 208 |  |  |  |  | 168 | 3 |  |
| Fyke nets, fish | 5 | 1 | 13 | 1 |  |  | 3 | 232 |
| Dip nets | 198 |  |  |  |  |  |  |  |
| Otter trawls |  |  |  |  |  | 10 |  |  |
| Yards at mouth |  |  |  |  |  | 290 |  |  |
| Slat traps |  |  |  | 2 | 3 |  |  |  |

### *Fisheries of Virginia, 1938*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Accomac | Caroline | Charles City | Chesterfield | Dinwiddie | Elizabeth City | Essex | Fairfax |
|---|---|---|---|---|---|---|---|---|
| Apparatus—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Pots, fish |  |  | 80 | 5 |  |  |  |  |
| Scrapes | 160 |  |  |  |  |  | 4 |  |
| Yards at mouth | 181 |  |  |  |  |  | 5 |  |
| Dredges: |  |  |  |  |  |  |  |  |
| Crab | 46 |  |  |  |  | 28 |  |  |
| Yards at mouth | 55 |  |  |  |  | 54 |  |  |
| Oyster |  |  |  |  |  | 14 |  |  |
| Yards at mouth |  |  |  |  |  | 21 |  |  |
| Tongs: |  |  |  |  |  |  |  |  |
| Oyster | 201 |  |  |  |  | 30 | 70 |  |
| Other | 79 |  |  |  |  | 8 |  |  |
| Rakes: |  |  |  |  |  |  |  |  |
| Oyster | 80 |  |  |  |  |  |  |  |
| Other | 41 |  |  |  |  |  |  |  |
| Picks | 100 |  |  |  |  |  |  |  |

| Item | Gloucester | Henrico | Isle of Wight | James City | King and Queen | King George | King William | Lancaster |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 55 |  | 2 |  |  |  |  | 517 |
| On boats and shore: |  |  |  |  |  |  |  |  |
| Regular | 347 | 2 | 76 | 13 |  | 33 | 2 | 197 |
| Casual | 53 | 21 | 21 | 35 | 52 | 81 | 97 | 323 |
| Total | 455 | 23 | 99 | 48 | 52 | 114 | 99 | 1,037 |
| Vessels: |  |  |  |  |  |  |  |  |
| Steam |  |  |  |  |  |  |  | 9 |
| Net tonnage |  |  |  |  |  |  |  | 956 |
| Motor | 17 |  | 1 |  |  |  |  | 5 |
| Net tonnage | 188 |  | 12 |  |  |  |  | 299 |
| Total vessels | 17 |  | 1 |  |  |  |  | 14 |
| Total net tonnage | 188 |  | 12 |  |  |  |  | 1,255 |
| Boats: |  |  |  |  |  |  |  |  |
| Motor | 228 | 1 | 45 | 14 | 1 | 49 | 2 | 398 |
| Other | 116 | 14 | 80 | 38 | 39 | 47 | 56 | 294 |
| Accessory boats |  |  |  |  |  |  |  | 39 |
| Apparatus: |  |  |  |  |  |  |  |  |
| Purse seines, menhaden |  |  |  |  |  |  |  | 13 |
| Length, yards |  |  |  |  |  |  |  | 4,090 |
| Haul seines | 1 | 3 |  | 1 |  | 2 | 2 | 4 |
| Length, yards | 500 | 1,150 |  | 600 |  | 1,000 | 230 | 1,513 |
| Gill nets: |  |  |  |  |  |  |  |  |
| Drift |  | 11 |  | 20 | 13 | 3 | 49 | 1 |
| Square yards |  | 6,875 |  | 22,100 | 8,860 | 1,500 | 41,300 | 500 |
| Runaround |  |  | 1 |  |  |  |  |  |
| Square yards |  |  | 167 |  |  |  |  |  |
| Stake | 14 |  | 1,030 | 1,290 | 549 | 283 | 235 |  |
| Square yards | 374 |  | 40,550 | 40,850 | 19,190 | 25,385 | 8,400 |  |
| Lines: |  |  |  |  |  |  |  |  |
| Hand |  |  |  | 200 |  |  |  |  |
| Hooks |  |  |  | 200 |  |  |  |  |
| Trot with baits or snoods | 43 |  | 85 |  |  | 42 | 6 | 154 |
| Baits or snoods | 30,800 |  | 33,900 |  |  | 15,000 | 1,800 | 170,000 |
| Trot with hooks |  |  | 1 |  |  |  |  |  |
| Hooks |  |  | 100 |  |  |  |  |  |
| Pound nets | 111 |  |  | 11 |  | 34 |  | 175 |
| Fyke nets: |  |  |  |  |  |  |  |  |
| Crab | 4 |  |  |  |  |  |  | 62 |
| Fish | 4 | 1 | 75 | 22 |  | 26 | 5 |  |
| Dip nets |  |  |  |  |  |  |  | 171 |
| Pots: |  |  |  |  |  |  |  |  |
| Eel | 12 |  | 12 |  |  |  |  |  |
| Fish |  |  |  | 60 |  |  |  |  |
| Turtle |  |  |  | 35 |  |  |  |  |
| Dredges: |  |  |  |  |  |  |  |  |
| Crab | 28 |  |  |  |  |  |  |  |
| Yards at mouth | 52 |  |  |  |  |  |  |  |
| Oyster | 10 |  | 2 |  |  |  |  | 2 |
| Yards at mouth | 15 |  | 3 |  |  |  |  | 3 |
| Tongs: |  |  |  |  |  |  |  |  |
| Oyster | 252 |  |  | 3 | 4 |  |  | 322 |
| Other | 33 |  |  |  |  |  |  |  |

## *Fisheries of Virginia, 1938*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Mathews | Middlesex | Nansemond | New Kent | Norfolk | Northampton | Northumberland | Prince George |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 79 | 5 | 4 | -------- | 54 | 3 | 763 | -------- |
| On boats and shore: | | | | | | | | |
| Regular | 471 | 220 | 125 | 2 | 43 | 523 | 318 | -------- |
| Casual | 300 | 208 | 8 | 36 | 66 | 80 | 352 | 27 |
| Total | 850 | 433 | 137 | 38 | 163 | 606 | 1, 433 | 27 |
| Vessels: | | | | | | | | |
| Steam | -------- | -------- | -------- | -------- | -------- | -------- | 16 | -------- |
| Net tonnage | -------- | -------- | -------- | -------- | -------- | -------- | 1, 924 | -------- |
| Motor | 23 | 2 | 1 | -------- | 9 | 1 | 6 | -------- |
| Net tonnage | 279 | 35 | 8 | -------- | 219 | 12 | 490 | -------- |
| Total vessels | 23 | 2 | 1 | -------- | 9 | 1 | 22 | -------- |
| Total net tonnage | 279 | 35 | 8 | -------- | 219 | 12 | 2, 414 | -------- |
| Boats: | | | | | | | | |
| Motor | 207 | 261 | 60 | 4 | 16 | 160 | 354 | 2 |
| Other | 302 | 125 | 29 | 27 | 98 | 521 | 590 | 17 |
| Accessory boats | -------- | -------- | -------- | -------- | -------- | -------- | 60 | -------- |
| Apparatus: | | | | | | | | |
| Purse seines, menhaden | -------- | -------- | -------- | -------- | -------- | -------- | 20 | -------- |
| Length, yards | -------- | -------- | -------- | -------- | -------- | -------- | 6, 800 | -------- |
| Haul seines | 7 | 8 | -------- | 2 | 3 | 4 | 10 | 2 |
| Length, yards | 5, 625 | 6, 625 | -------- | 425 | 1, 600 | 1, 300 | 475 | 1, 000 |
| Gill nets: | | | | | | | | |
| Drift | 3 | -------- | -------- | 19 | -------- | 2 | -------- | 17 |
| Square yards | 2, 700 | -------- | -------- | 17, 300 | -------- | 756 | -------- | 12, 500 |
| Runaround | -------- | -------- | 4 | 1 | -------- | -------- | -------- | -------- |
| Square yards | -------- | -------- | 1, 422 | 180 | -------- | -------- | -------- | -------- |
| Stake | -------- | -------- | 38 | 106 | -------- | -------- | -------- | -------- |
| Square yards | -------- | -------- | 1, 300 | 2, 568 | -------- | -------- | -------- | -------- |
| Lines: | | | | | | | | |
| Trot with baits or snoods | 71 | 84 | 28 | 2 | 69 | 115 | 162 | -------- |
| Baits or snoods | 31, 400 | 40, 700 | 9, 000 | 700 | 20, 100 | 51, 500 | 106, 200 | -------- |
| Trot with hooks | -------- | -------- | -------- | 1 | -------- | -------- | -------- | 1 |
| Hooks | -------- | -------- | -------- | 300 | -------- | -------- | -------- | 300 |
| Pound nets | 544 | 14 | -------- | -------- | 32 | 121 | 291 | -------- |
| Fyke nets: | | | | | | | | |
| Crab | 62 | 16 | -------- | -------- | -------- | -------- | 227 | -------- |
| Fish | 2 | -------- | 30 | 21 | -------- | -------- | -------- | 4 |
| Dip nets | 80 | 45 | -------- | -------- | 15 | 50 | 320 | -------- |
| Otter trawls | 4 | -------- | -------- | -------- | 3 | -------- | -------- | -------- |
| Yards at mouth | 115 | -------- | -------- | -------- | 90 | -------- | -------- | -------- |
| Pots: | | | | | | | | |
| Crab | -------- | -------- | -------- | -------- | -------- | -------- | 683 | -------- |
| Fish | -------- | -------- | -------- | 15 | -------- | -------- | -------- | 45 |
| Scrapes | -------- | 6 | -------- | -------- | -------- | -------- | -------- | -------- |
| Yards at mouth | -------- | 8 | -------- | -------- | -------- | -------- | -------- | -------- |
| Dredges: | | | | | | | | |
| Crab | 32 | 4 | -------- | -------- | 2 | 2 | 4 | -------- |
| Yards at mouth | 59 | 7 | -------- | -------- | 3 | 4 | 8 | -------- |
| Oyster | 10 | -------- | 2 | -------- | 16 | 5 | -------- | -------- |
| Yards at mouth | 16 | -------- | 3 | -------- | 32 | 6 | -------- | -------- |
| Tongs: | | | | | | | | |
| Oyster | 134 | 383 | 112 | -------- | -------- | 32 | 155 | -------- |
| Other | 20 | -------- | -------- | -------- | -------- | 5 | -------- | -------- |
| Rakes: | | | | | | | | |
| Oyster | -------- | -------- | -------- | -------- | -------- | 112 | -------- | -------- |
| Other | -------- | -------- | -------- | -------- | -------- | 200 | -------- | -------- |

## *Fisheries of Virginia, 1938*—Continued

### OPERATING UNITS: By counties—Continued

| Item | Princess Anne | Prince William | Richmond | Stafford | Surry | Warwick | Westmoreland | York |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels |  |  |  |  |  | 9 |  | 170 |
| On boats and shore: |  |  |  |  |  |  |  |  |
| Regular | 52 |  | 59 | 28 |  | 8 | 252 | 164 |
| Casual | 32 | 51 | 58 | 44 | 18 | 12 | 299 | 36 |
| Total | 84 | 51 | 117 | 72 | 18 | 29 | 551 | 370 |
| Vessels, motor |  |  |  |  |  | 2 |  | 53 |
| Net tonnage |  |  |  |  |  | 34 |  | 527 |
| Boats: |  |  |  |  |  |  |  |  |
| Motor | 7 | 18 | 33 | 20 | 5 | 6 | 367 | 133 |
| Other | 54 | 25 | 52 | 26 | 9 | 19 | 140 | 56 |
| Apparatus: |  |  |  |  |  |  |  |  |
| Haul seines | 8 | 11 | 1 | 11 | 3 |  | 8 | 13 |
| Length, yards | 1,775 | 3,050 | 200 | 3,050 | 900 |  | 2,600 | 12,100 |
| Gill nets: |  |  |  |  |  |  |  |  |
| Drift |  | 3 |  |  | 2 |  |  |  |
| Square yards |  | 2,560 |  |  | 2,500 |  |  |  |
| Runaround |  |  |  |  |  |  |  |  |
| Square yards |  |  |  |  |  |  |  | 3,600 |
| Stake |  | 284 | 712 | 64 | 20 |  | 8 |  |
| Square yards |  | 13,680 | 26,720 | 35,632 | 800 |  | 800 |  |
| Lines: |  |  |  |  |  |  |  |  |
| Trot with baits or snoods | 37 |  | 5 | 9 |  | 12 | 201 | 47 |
| Baits or snoods | 11,100 |  | 1,500 | 3,800 |  | 4,300 | 103,400 | 39,600 |
| Pound nets | 4 |  | 40 | 7 |  | 16 | 58 | 34 |
| Fyke nets: |  |  |  |  |  |  |  |  |
| Crab |  |  |  |  |  |  | 37 |  |
| Fish |  | 53 | 2 | 38 | 26 | 23 | 24 | 10 |
| Dip nets |  |  |  |  |  | 5 | 60 | 10 |
| Otter trawls |  |  |  |  |  | 1 |  | 10 |
| Yards at mouth |  |  |  |  |  | 25 |  | 256 |
| Pots: |  |  |  |  |  |  |  |  |
| Crab |  |  |  |  |  |  | 57 |  |
| Eel |  | 40 |  | 370 |  |  | 300 |  |
| Fish |  |  |  |  | 40 |  |  |  |
| Dredges: |  |  |  |  |  |  |  |  |
| Crab |  |  |  |  |  | 2 |  | 148 |
| Yards at mouth |  |  |  |  |  | 4 |  | 239 |
| Oyster |  |  |  |  |  |  |  | 6 |
| Yards at mouth |  |  |  |  |  |  |  | 9 |
| Tongs: |  |  |  |  |  |  |  |  |
| Oyster | 15 |  | 50 |  |  |  | 305 | 30 |
| Other | 2 |  |  |  |  |  |  | 94 |

### CATCH: By counties

| Species | Accomac |  | Caroline |  | Charles City |  | Chesterfield |  |
|---|---|---|---|---|---|---|---|---|
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 546,100 | $4,273 |  |  | 2,400 | $24 | 15,800 | $324 |
| Bluefish | 45,200 | 3,840 |  |  |  |  |  |  |
| Bonito | 700 | 21 |  |  |  |  |  |  |
| Butterfish | 535,100 | 8,438 |  |  |  |  |  |  |
| Cabio or crab eater | 7,800 | 442 |  |  |  |  |  |  |
| Carp |  |  | 300 | $18 | 52,200 | 1,566 | 91,000 | 2,730 |
| Catfish and bullheads |  |  | 500 | 25 | 83,200 | 3,328 | 9,300 | 372 |
| Croaker | 2,633,200 | 26,907 |  |  |  |  |  |  |
| Drum: |  |  |  |  |  |  |  |  |
| Black | 92,200 | 878 |  |  |  |  |  |  |
| Red or redfish | 51,700 | 651 |  |  |  |  |  |  |
| Eels, common | 10,400 | 1,224 |  |  | 2,500 | 116 | 400 | 16 |
| Flounders | 41,100 | 1,996 |  |  |  |  |  |  |
| Gizzard shad |  |  |  |  | 6,500 | 97 | 8,300 | 166 |
| Harvestfish | 19,100 | 382 |  |  |  |  |  |  |
| Hickory shad | 7,600 | 155 |  |  |  |  | 200 | 10 |
| King whiting or "kingfish" | 11,400 | 578 |  |  |  |  |  |  |
| Mackerel | 12,300 | 438 |  |  |  |  |  |  |
| Menhaden | 33,000 | 109 |  |  |  |  |  |  |
| Scup | 42,500 | 800 |  |  |  |  |  |  |
| Sea bass | 70,000 | 2,800 |  |  |  |  |  |  |
| Shad | 197,800 | 18,915 | 600 | 90 | 65,900 | 5,272 | 10,300 | 1,030 |
| Sharks | 500 | 5 |  |  |  |  |  |  |
| Skates | 1,200 | 8 |  |  |  |  |  |  |
| Spanish mackerel | 7,100 | 509 |  |  |  |  |  |  |
| Spot | 123,700 | 3,098 |  |  |  |  |  |  |

## *Fisheries of Virginia, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Accomac | | Caroline | | Charles City | | Chesterfield | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 1, 813, 200 | $55, 235 | | | | | | |
| Spotted | 40, 000 | 3, 600 | | | | | | |
| Striped bass | 31, 700 | 2, 536 | 100 | $15 | 3, 600 | $432 | 9, 400 | $752 |
| Sturgeon | 600 | 90 | | | | | | |
| White perch | 16, 200 | 314 | 300 | 45 | 2, 300 | 115 | 4, 000 | 160 |
| Whiting | 1, 200 | 36 | | | | | | |
| Yellow perch | | | | | 300 | 15 | | |
| Crabs: | | | | | | | | |
| Hard | 7, 385, 500 | 96, 954 | | | | | | |
| Soft and peelers | 1, 567, 300 | 100, 122 | | | | | | |
| Clams, hard, public | 1, 226, 000 | 224, 050 | | | | | | |
| Mussels, sea | 30, 000 | 900 | | | | | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 153, 500 | 11, 810 | | | | | | |
| Public, fall | 336, 500 | 24, 515 | | | | | | |
| Private, spring | 427, 000 | 32, 770 | | | | | | |
| Private, fall | 919, 600 | 61, 380 | | | | | | |
| Squid | 25, 300 | 436 | | | | | | |
| Total | 18, 463, 300 | 691, 215 | 1, 800 | 193 | 218, 900 | 10, 965 | 148, 700 | 5, 560 |

| Species | Dinwiddie | | Elizabeth City | | Essex | | Fairfax | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 1, 600 | $37 | 865, 500 | $6, 924 | 2, 400 | $51 | | |
| Bluefish | | | 27, 800 | 1, 987 | | | | |
| Butterfish | | | 253, 700 | 3, 640 | | | | |
| Cabio or crab eater | | | 4, 900 | 147 | | | | |
| Carp | 300 | 12 | 400 | 4 | 3, 600 | 144 | 64, 200 | $6, 196 |
| Catfish and bullheads | 400 | 24 | 14, 500 | 447 | 5, 200 | 208 | 115, 100 | 4, 709 |
| Cod | | | 200 | 4 | | | | |
| Croaker | | | 7, 250, 200 | 103, 903 | 10, 000 | 500 | | |
| Drum: | | | | | | | | |
| Black | | | 3, 800 | 39 | | | | |
| Red or redfish | | | 11, 900 | 160 | | | | |
| Eels: | | | | | | | | |
| Common | | | 2, 600 | 194 | 200 | 20 | 25, 700 | 2, 570 |
| Conger | | | 2, 200 | 27 | | | | |
| Flounders | | | 235, 600 | 13, 519 | | | | |
| Gizzard shad | | | 4, 800 | 72 | 8, 200 | 82 | | |
| Hake | | | 6, 000 | 74 | | | | |
| Harvestfish | | | 117, 100 | 1, 758 | | | | |
| Hickory shad | 800 | 28 | 9, 000 | 179 | 200 | 8 | | |
| Hogfish | | | 100 | 2 | | | | |
| King whiting or "kingfish" | | | 67, 600 | 2, 641 | | | | |
| Mackerel | | | 4, 400 | 416 | | | | |
| Menhaden | | | 235, 800 | 472 | | | | |
| Mullet | | | 2, 900 | 101 | | | | |
| Pike or pickerel | | | | | | | 300 | 42 |
| Pollock | | | 100 | 1 | | | | |
| Sand perch | | | 3, 300 | 44 | | | | |
| Scup | | | 873, 700 | 13, 281 | | | | |
| Sea bass | | | 60, 100 | 2, 615 | | | | |
| Sea robin | | | 500 | 5 | | | | |
| Shad | | | 270, 400 | 29, 731 | 3, 200 | 395 | 37, 400 | 3, 900 |
| Sharks | | | 34, 600 | 425 | | | | |
| Spanish mackerel | | | 37, 200 | 2, 604 | | | | |
| Spot | | | 193, 200 | 2, 860 | 800 | 24 | | |
| Squeteagues or "sea trout," gray | | | 2, 211, 200 | 38, 344 | 1, 200 | 36 | | |
| Striped bass | | | 134, 400 | 12, 096 | 2, 400 | 240 | 8, 500 | 595 |
| Sturgeon | | | 5, 400 | 764 | | | | |
| Swellfish | | | 13, 500 | 408 | | | | |
| Tautog | | | 800 | 10 | | | | |
| Tomcod | | | 1, 600 | 19 | | | | |
| White perch | 200 | 12 | 52, 100 | 1, 442 | 4, 300 | 298 | 42, 200 | 1, 266 |
| Whiting | | | 121, 900 | 2, 282 | | | | |
| Yellow perch | | | | | 100 | 15 | 21, 400 | 1, 498 |
| Crabs, hard | | | 1, 218, 000 | 28, 542 | 42, 000 | 745 | | |
| Lobsters | | | 600 | 61 | | | | |
| Shrimp | | | 1, 000 | 100 | | | | |
| Clams, hard, public | | | 20, 600 | 1, 610 | | | | |
| Oysters, market: | | | | | | | | |
| Public, spring | | | | | 110, 000 | 11, 775 | | |
| Public, fall | | | | | 110, 000 | 11, 775 | | |
| Private, spring | | | 347, 000 | 30, 118 | 56, 000 | 6, 000 | | |
| Private, fall | | | 730, 500 | 57, 512 | 98, 000 | 10, 500 | | |
| Squid | | | 29, 000 | 426 | | | | |
| Total | 3, 300 | 113 | 15, 481, 700 | 362, 010 | 457, 800 | 42, 816 | 314, 800 | 20, 776 |

## *Fisheries of Virginia, 1938*—Continued

### CATCH: BY COUNTIES—Continued

| Species | Gloucester | | Henrico | | Isle of Wight | | James City | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 378,200 | $2,890 | 700 | $14 | 33,500 | $508 | 8,600 | $108 |
| Bluefish | 1,600 | 80 | -------- | -------- | -------- | -------- | 100 | 7 |
| Butterfish | 34,900 | 530 | -------- | -------- | -------- | -------- | -------- | -------- |
| Cabio or crab eater | 1,300 | 60 | -------- | -------- | -------- | -------- | -------- | -------- |
| Carp | -------- | -------- | 3,300 | 102 | 16,300 | 489 | 8,900 | 347 |
| Catfish and bullheads | 200 | 10 | 2,000 | 80 | 40,300 | 1,339 | 77,000 | 3,080 |
| Croaker | 6,044,900 | 75,306 | -------- | -------- | 13,000 | 260 | 700 | 14 |
| Eels, common | 2,500 | 250 | -------- | -------- | 2,200 | 132 | 3,200 | 202 |
| Flounders | 13,400 | 670 | -------- | -------- | 1,800 | 90 | 200 | 12 |
| Gizzard shad | 400 | 8 | 3,100 | 31 | 44,000 | 440 | 5,000 | 25 |
| Harvestfish | 17,900 | 267 | -------- | -------- | -------- | -------- | -------- | -------- |
| Hickory shad | 3,500 | 70 | -------- | -------- | 900 | 27 | 1,200 | 24 |
| King whiting or "kingfish" | 1,400 | 70 | -------- | -------- | -------- | -------- | -------- | -------- |
| Menhaden | 9,600 | 48 | -------- | -------- | -------- | -------- | -------- | -------- |
| Mullet | -------- | -------- | -------- | -------- | 2,000 | 60 | -------- | -------- |
| Shad | 92,600 | 8,667 | 3,700 | 300 | 42,500 | 4,539 | 47,200 | 4,910 |
| Spanish mackerel | 2,400 | 168 | -------- | -------- | -------- | -------- | -------- | -------- |
| Spot | 43,000 | 651 | -------- | -------- | -------- | -------- | -------- | -------- |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 719,400 | 10,760 | -------- | -------- | 7,000 | 210 | 200 | 12 |
| Spotted | 300 | 24 | -------- | -------- | -------- | -------- | -------- | -------- |
| Striped bass | 16,700 | 1,340 | 2,100 | 168 | 35,700 | 2,901 | 18,500 | 1,480 |
| White perch | 1,600 | 33 | 2,300 | 92 | 9,800 | 392 | 3,100 | 116 |
| Yellow perch | -------- | -------- | -------- | -------- | 600 | 36 | 100 | 6 |
| Crabs: | | | | | | | | |
| Hard | 2,477,000 | 38,924 | -------- | -------- | 633,000 | 12,660 | 800 | 16 |
| Soft and peelers | 26,700 | 2,200 | -------- | -------- | -------- | -------- | -------- | -------- |
| Clams: | | | | | | | | |
| Hard, public | 362,700 | 27,200 | -------- | -------- | -------- | -------- | -------- | -------- |
| Soft, public | 2,500 | 1,000 | -------- | -------- | -------- | -------- | -------- | -------- |
| Oysters, market: | | | | | | | | |
| Public, spring | 10,000 | 800 | -------- | -------- | -------- | -------- | 2,400 | 180 |
| Public, fall | 33,000 | 2,600 | -------- | -------- | -------- | -------- | 1,200 | 90 |
| Private, spring | 94,100 | 8,242 | -------- | -------- | -------- | -------- | -------- | -------- |
| Private, fall | 265,100 | 22,547 | -------- | -------- | 3,600 | 255 | -------- | -------- |
| Terrapin, diamond-back | 4,300 | 150 | -------- | -------- | -------- | -------- | -------- | -------- |
| Turtle, snapper | -------- | -------- | -------- | -------- | -------- | -------- | 10,600 | 990 |
| Total | 10,661,200 | 205,565 | 17,200 | 787 | 886,200 | 24,338 | 189,000 | 11,619 |

| Species | King and Queen | | King George | | King William | | Lancaster | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | -------- | -------- | 16,300 | $163 | 25,700 | $288 | 4,811,000 | $48,110 |
| Bluefish | -------- | -------- | -------- | -------- | -------- | -------- | 8,100 | 405 |
| Butterfish | -------- | -------- | -------- | -------- | -------- | -------- | 8,600 | 94 |
| Cabio or crab eater | -------- | -------- | -------- | -------- | -------- | -------- | 2,100 | 86 |
| Carp | -------- | -------- | 3,700 | 111 | -------- | -------- | 500 | 15 |
| Catfish and bullheads | -------- | -------- | 30,700 | 1,228 | 500 | 15 | 200 | 8 |
| Croaker | -------- | -------- | -------- | -------- | -------- | -------- | 1,480,200 | 16,939 |
| Drum: | | | | | | | | |
| Black | -------- | -------- | -------- | -------- | -------- | -------- | 3,700 | 20 |
| Red or redfish | -------- | -------- | -------- | -------- | -------- | -------- | 2,800 | 28 |
| Eels, common | -------- | -------- | 2,500 | 250 | -------- | -------- | 3,000 | 300 |
| Flounders | -------- | -------- | -------- | -------- | -------- | -------- | 17,700 | 708 |
| Gizzard shad | -------- | -------- | 54,100 | 541 | 1,200 | 12 | 5,300 | 35 |
| Harvestfish | -------- | -------- | -------- | -------- | -------- | -------- | 5,900 | 94 |
| Hickory shad | -------- | -------- | -------- | -------- | 200 | 6 | 13,200 | 260 |
| King whiting or "kingfish" | -------- | -------- | -------- | -------- | -------- | -------- | 700 | 21 |
| Menhaden | -------- | -------- | -------- | -------- | -------- | -------- | 33,576,000 | 128,966 |
| Pike or pickerel | -------- | -------- | 1,600 | 290 | -------- | -------- | -------- | -------- |
| Shad | 17,800 | $2,136 | 2,500 | 246 | 31,900 | 3,482 | 397,100 | 31,768 |
| Spanish mackerel | -------- | -------- | -------- | -------- | -------- | -------- | 400 | 28 |
| Spot | -------- | -------- | -------- | -------- | -------- | -------- | 59,300 | 853 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | -------- | -------- | -------- | -------- | -------- | -------- | 1,027,400 | 15,507 |
| Spotted | -------- | -------- | -------- | -------- | -------- | -------- | 6,000 | 433 |
| Striped bass | 500 | 50 | 30,700 | 2,763 | 1,700 | 136 | 90,000 | 6,200 |
| Sturgeon | -------- | -------- | -------- | -------- | -------- | -------- | 200 | 25 |
| White perch | -------- | -------- | 20,800 | 1,040 | 200 | 10 | 13,500 | 282 |
| Yellow perch | -------- | -------- | 4,400 | 308 | 300 | 27 | 700 | 42 |
| Crabs: | | | | | | | | |
| Hard | -------- | -------- | 294,000 | 7,350 | 40,000 | 800 | 2,652,500 | 46,419 |
| Soft and peelers | -------- | -------- | -------- | -------- | -------- | -------- | 247,800 | 19,570 |
| Oysters, market: | | | | | | | | |
| Public, spring | -------- | -------- | -------- | -------- | -------- | -------- | 234,000 | 23,400 |
| Public, fall | 1,800 | 150 | -------- | -------- | -------- | -------- | 623,000 | 62,300 |
| Private, spring | -------- | -------- | -------- | -------- | -------- | -------- | 306,000 | 30,600 |
| Private, fall | -------- | -------- | -------- | -------- | -------- | -------- | 353,100 | 35,310 |
| Total | 20,100 | 2,336 | 461,300 | 14,290 | 101,700 | 4,776 | 45,950,000 | 468,826 |

## *Fisheries of Virginia, 1938*—Continued

### CATCH: BY COUNTIES—Continued

| Species | Mathews | | Middlesex | | Nansemond | | New Kent | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 2,968,000 | $20,776 | 44,600 | $565 | -------- | -------- | 83,300 | $1,166 |
| Bluefish | 49,100 | 2,461 | 12,700 | 716 | -------- | -------- | -------- | -------- |
| Butterfish | 271,700 | 4,747 | -------- | -------- | -------- | -------- | -------- | -------- |
| Carp | -------- | -------- | 10,200 | 304 | -------- | -------- | 200 | 6 |
| Catfish and bullheads | 500 | 15 | 9,000 | 240 | 2,400 | $103 | 23,100 | 753 |
| Cod | 100 | 6 | -------- | -------- | -------- | -------- | -------- | -------- |
| Croaker | 15,921,900 | 201,731 | 356,400 | 3,481 | 24,000 | 480 | -------- | -------- |
| Drum: | | | | | | | | |
| Black | 900 | 6 | -------- | -------- | -------- | -------- | -------- | -------- |
| Red or redfish | 2,000 | 13 | 600 | 36 | -------- | -------- | -------- | -------- |
| Eels: | | | | | | | | |
| Common | -------- | -------- | -------- | -------- | -------- | -------- | 600 | 30 |
| Conger | 1,000 | 11 | -------- | -------- | -------- | -------- | -------- | -------- |
| Flounders | 153,500 | 8,803 | 1,300 | 68 | -------- | -------- | 400 | 20 |
| Gizzard shad | 14,200 | 102 | 24,900 | 345 | 51,000 | 765 | 7,800 | 65 |
| Hake | 800 | 12 | -------- | -------- | -------- | -------- | -------- | -------- |
| Harvestfish | 151,100 | 3,022 | -------- | -------- | -------- | -------- | -------- | -------- |
| Hickory shad | 34,700 | 694 | 400 | 8 | -------- | -------- | 200 | 6 |
| King whiting or "kingfish" | 4,800 | 208 | -------- | -------- | -------- | -------- | -------- | -------- |
| Mackerel | 200 | 5 | -------- | -------- | -------- | -------- | -------- | -------- |
| Menhaden | 372,000 | 465 | -------- | -------- | -------- | -------- | -------- | -------- |
| Mullet | 14,300 | 572 | -------- | -------- | -------- | -------- | 600 | 24 |
| Scup | 181,400 | 4,578 | -------- | -------- | -------- | -------- | -------- | -------- |
| Sea bass | 81,900 | 3,880 | -------- | -------- | -------- | -------- | -------- | -------- |
| Shad | 1,387,100 | 124,839 | 6,200 | 680 | 7,100 | 819 | 18,800 | 1,986 |
| Skates | -------- | -------- | 2,400 | 82 | -------- | -------- | -------- | -------- |
| Spanish mackerel | 164,300 | 10,008 | -------- | -------- | -------- | -------- | -------- | -------- |
| Spot | 940,100 | 19,049 | 49,500 | 958 | -------- | -------- | -------- | -------- |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 2,142,900 | 23,669 | 23,900 | 733 | 15,000 | 450 | 700 | 21 |
| Spotted | 34,200 | 2,733 | 20,100 | 1,400 | -------- | -------- | -------- | -------- |
| Striped bass | 69,000 | 4,830 | 29,800 | 2,076 | 10,000 | 900 | 3,600 | 365 |
| Sturgeon | 4,800 | 759 | -------- | -------- | -------- | -------- | -------- | -------- |
| Tautog | 100 | 2 | -------- | -------- | -------- | -------- | -------- | -------- |
| Tomcod | 200 | 2 | -------- | -------- | -------- | -------- | -------- | -------- |
| White perch | 5,000 | 147 | 3,500 | 58 | 8,000 | 250 | 2,500 | 100 |
| Whiting | 4,700 | 56 | -------- | -------- | -------- | -------- | -------- | -------- |
| Yellow perch | -------- | -------- | 8,500 | 294 | -------- | -------- | 300 | 15 |
| Crabs: | | | | | | | | |
| Hard | 1,988,700 | 36,673 | 1,181,000 | 16,040 | 235,000 | 3,525 | 12,000 | 240 |
| Soft and peelers | 160,800 | 25,697 | 75,500 | 7,046 | -------- | -------- | -------- | -------- |
| Lobsters | 700 | 86 | -------- | -------- | -------- | -------- | -------- | -------- |
| Clams, hard, public | 56,000 | 5,900 | -------- | -------- | -------- | -------- | -------- | -------- |
| Oysters, market: | | | | | | | | |
| Public, spring | 115,200 | 9,600 | 397,300 | 39,730 | 25,000 | 2,000 | -------- | -------- |
| Public, fall | 203,800 | 18,496 | 436,300 | 43,630 | 150,000 | 12,000 | -------- | -------- |
| Private, spring | 100,900 | 9,092 | 200,800 | 19,780 | 75,000 | 6,000 | -------- | -------- |
| Private, fall | 217,800 | 19,808 | 230,600 | 22,620 | 124,000 | 9,800 | -------- | -------- |
| Squid | 11,800 | 170 | -------- | -------- | -------- | -------- | -------- | -------- |
| Total | 27,832,200 | 563,723 | 3,125,500 | 160,890 | 726,500 | 37,092 | 154,100 | 4,797 |

| Species | Norfolk | | Northampton | | Northumberland | | Prince George | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 245,400 | $1,841 | 203,900 | $1,526 | 6,833,700 | $68,437 | 3,100 | $62 |
| Bluefish | 37,900 | 1,903 | 25,200 | 1,260 | 20,700 | 1,030 | -------- | -------- |
| Bonito | -------- | -------- | 34,100 | 1,023 | -------- | -------- | -------- | -------- |
| Butterfish | 651,400 | 5,185 | 780,900 | 11,714 | 9,400 | 146 | -------- | -------- |
| Cabio or crab eater | 1,000 | 60 | 1,700 | 85 | 2,400 | 106 | -------- | -------- |
| Carp | -------- | -------- | -------- | -------- | 22,600 | 541 | 16,000 | 480 |
| Catfish and bullheads | -------- | -------- | -------- | -------- | 1,500 | 60 | 18,600 | 744 |
| Croaker | 1,829,300 | 26,653 | 888,800 | 8,888 | 436,400 | 6,099 | -------- | -------- |
| Drum: | | | | | | | | |
| Black | -------- | -------- | 11,000 | 55 | 5,200 | 26 | -------- | -------- |
| Red or redfish | 16,700 | 271 | 14,300 | 143 | 3,900 | 28 | -------- | -------- |
| Eels: | | | | | | | | |
| Common | -------- | -------- | 32,400 | 4,860 | 12,900 | 1,032 | 300 | 9 |
| Conger | 300 | 4 | -------- | -------- | -------- | -------- | -------- | -------- |
| Flounders | 77,100 | 4,184 | 12,000 | 483 | 30,100 | 1,108 | -------- | -------- |
| Gizzard shad | -------- | -------- | 1,200 | 12 | 13,900 | 143 | -------- | -------- |
| Hake | 3,200 | 69 | -------- | -------- | -------- | -------- | -------- | -------- |
| Harvestfish | 112,500 | 1,691 | 800 | 16 | 6,900 | 138 | -------- | -------- |
| Hickory shad | 26,500 | 400 | 2,500 | 38 | 33,300 | 563 | 1,000 | 40 |
| Hogfish | 100 | 3 | -------- | -------- | -------- | -------- | -------- | -------- |
| King whiting or "kingfish" | 58,900 | 2,788 | 5,100 | 255 | 300 | 11 | -------- | -------- |

## *Fisheries of Virginia, 1938*—Continued

### CATCH: BY COUNTIES—Continued

| Species | Norfolk | | Northampton | | Northumberland | | Prince George | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Mackerel | 200 | $17 | | | | | | |
| Menhaden | | | | | 60, 794, 100 | $230,888 | | |
| Mullet | | | 3, 000 | $170 | 600 | 18 | | |
| Scup | 626, 800 | 12, 520 | | | | | | |
| Sea bass | 64, 400 | 2, 476 | 1, 100 | 44 | | | | |
| Sea robin | 700 | 9 | | | | | | |
| Shad | 102, 000 | 9, 680 | 33, 300 | 3, 500 | 618, 600 | 56, 555 | 24, 100 | $1, 928 |
| Sharks | 2, 500 | 56 | 10, 200 | 100 | | | | |
| Skates | | | | | 5, 000 | 25 | | |
| Spanish mackerel | 86, 500 | 6, 525 | 80, 000 | 5 600 | 2, 700 | 146 | | |
| Spot | 1, 181, 800 | 23, 629 | 89, 200 | 1, 960 | 24, 400 | 367 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 362, 800 | 8, 118 | 2, 621, 200 | 39, 333 | 430, 700 | 8, 615 | | |
| Spotted | 61, 500 | 5, 535 | 3, 300 | 330 | 8, 900 | 712 | | |
| Striped bass | 1, 700 | 136 | 42, 000 | 3, 360 | 254, 600 | 17, 822 | 800 | 64 |
| Sturgeon | 400 | 60 | 200 | 35 | 400 | 60 | | |
| Swellfish | 10, 000 | 150 | | | | | | |
| Tautog | 100 | 5 | | | | | | |
| White perch | | | 10, 500 | 105 | 13, 700 | 318 | 400 | 20 |
| Whiting | 3, 500 | 60 | | | | | | |
| Yellow perch | | | | | 300 | 24 | | |
| Crabs: | | | | | | | | |
| Hard | 628, 400 | 9, 795 | 1, 208, 000 | 15, 689 | 3, 188, 300 | 55, 709 | | |
| Soft and peelers | 1, 800 | 360 | 490, 100 | 29, 406 | 187, 000 | 22, 546 | | |
| Lobsters | 100 | 10 | | | | | | |
| Shrimp | 7, 000 | 880 | | | | | | |
| Clams: | | | | | | | | |
| Hard, public | | | 698, 600 | 80, 500 | | | | |
| Hard, private | | | 52, 200 | 5, 000 | | | | |
| Oysters, market: | | | | | | | | |
| Public, spring | | | 20, 000 | 1, 500 | 210, 000 | 16, 000 | | |
| Public, fall | | | 60, 000 | 5, 250 | 325, 200 | 24, 400 | | |
| Private, spring | 803, 300 | 66, 946 | 509, 800 | 40, 299 | 191, 400 | 13, 333 | | |
| Private, fall | 1, 573, 100 | 112, 255 | 648, 200 | 54, 155 | 315, 200 | 24, 423 | | |
| Squid | 14, 200 | 229 | 140, 600 | 1, 406 | | | | |
| Total | 8, 593, 100 | 304, 503 | 8, 735, 400 | 318, 100 | 74, 004, 300 | 551, 429 | 64, 300 | 3, 347 |

| Species | Princess Anne | | Prince William | | Richmond | | Stafford | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 2, 700 | $18 | 500 | $8 | 14, 000 | $280 | | |
| Bluefish | 18, 400 | 920 | | | | | | |
| Butterfish | 516, 900 | 5, 714 | | | | | | |
| Cabio or crab eater | 500 | 25 | | | | | | |
| Carp | | | 149, 200 | 12, 908 | 5, 000 | 150 | 71, 500 | $5, 800 |
| Catfish and bullheads | | | 14, 900 | 745 | 20, 600 | 824 | 126, 400 | 5, 096 |
| Croaker | 654, 000 | 7, 809 | | | 20, 800 | 624 | | |
| Drum, red or redfish | 15, 500 | 238 | | | | | | |
| Eels, common | | | 900 | 101 | 3, 600 | 300 | 30, 100 | 3, 085 |
| Flounders | 6, 300 | 189 | | | 600 | 30 | | |
| Gizzard shad | | | 2, 300 | 46 | 33, 800 | 340 | 84, 500 | 1, 270 |
| Harvest fish | 40, 000 | 600 | | | | | | |
| Hickory shad | | | | | 400 | 12 | | |
| King whiting or "kingfish" | 60, 000 | 2, 400 | | | | | | |
| Pike or pickerel | | | | | | | 200 | 23 |
| Shad | 3, 800 | 342 | 13, 900 | 1, 390 | 25, 300 | 2, 450 | 9, 600 | 936 |
| Spanish mackerel | 53, 100 | 3, 717 | | | | | | |
| Spot | 566, 100 | 8, 402 | | | 1, 200 | 36 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 219, 800 | 3, 176 | | | 5, 000 | 120 | | |
| Spotted | 36, 400 | 2, 912 | | | 300 | 27 | | |
| Striped bass | 5, 700 | 456 | 40, 600 | 3, 248 | 17, 700 | 1, 720 | 155, 200 | 13, 997 |
| White perch | | | 9, 100 | 273 | 12, 900 | 463 | 5, 400 | 233 |
| Yellow perch | | | 4, 400 | 396 | 1, 300 | 91 | 9, 500 | 470 |
| Crabs, hard | 555, 000 | 8, 325 | | | 30, 000 | 600 | 48, 000 | 1, 440 |
| Clams, hard, public | 300 | 42 | | | | | | |
| Oysters, market: | | | | | | | | |
| Public, spring | | | | | 58, 800 | 5, 800 | | |
| Public, fall | | | | | 86, 800 | 8, 680 | | |
| Private, spring | 35, 000 | 4, 000 | | | 49, 000 | 4, 900 | | |
| Private, fall | 70, 000 | 8, 000 | | | 70, 000 | 7, 000 | | |
| Total | 2, 859, 500 | 57, 285 | 235, 800 | 19, 115 | 457, 100 | 34, 447 | 540, 400 | 32, 350 |

*Fisheries of Virginia, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Surry | | Warwick | | Westmoreland | | York | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 2,500 | $50 | 19,900 | $159 | 503,500 | $5,035 | 58,000 | $420 |
| Bluefish | 100 | 10 | 300 | 21 | 4,400 | 200 | 51,500 | 2,574 |
| Butterfish | | | 7,500 | 182 | 1,400 | 21 | 68,500 | 1,549 |
| Cabio or crab eater | | | | | | | 1,000 | 50 |
| Carp | 2,000 | 60 | 4,000 | 160 | 13,800 | 1,008 | | |
| Catfish and bullheads | 29,600 | 1,327 | 6,300 | 192 | 32,200 | 1,475 | | |
| Cod | | | | | | | 100 | 3 |
| Croaker | | | 255,400 | 5,464 | 49,600 | 720 | 5,415,700 | 73,041 |
| Drum, red or redfish | | | 2,500 | 40 | | | 11,700 | 181 |
| Eels: | | | | | | | | |
| Common | | | | | 25,600 | 2,304 | 100 | 3 |
| Conger | | | 100 | 2 | | | 100 | 1 |
| Flounders | | | 17,300 | 982 | 1,200 | 60 | 162,500 | 9,407 |
| Gizzard shad | 4,000 | 60 | 3,000 | 43 | 45,000 | 530 | | |
| Hake | | | 200 | 4 | | | 1,900 | 20 |
| Harvestfish | | | 2,200 | 25 | | | 15,000 | 300 |
| Hickory shad | 100 | 3 | 1,200 | 18 | 3,200 | 100 | 100 | 2 |
| Hogfish | | | | | | | 200 | 3 |
| King whiting or "kingfish" | | | 5,600 | 234 | 400 | 8 | 44,800 | 1,708 |
| Mackerel | | | | | | | 300 | 13 |
| Pike or pickerel | 100 | 15 | | | | | | |
| Sand perch | | | 700 | 10 | | | 3,300 | 43 |
| Scup | | | 56,400 | 774 | | | 563,000 | 6,297 |
| Sea bass | | | 2,900 | 133 | | | 21,200 | 1,059 |
| Sea robin | | | 900 | 6 | | | 900 | 10 |
| Shad | 5,000 | 481 | 14,200 | 1,528 | 73,400 | 5,874 | 44,300 | 4,430 |
| Sharks | | | 33,200 | 387 | | | 156,300 | 1,783 |
| Spanish mackerel | | | | | 400 | 28 | 2,900 | 203 |
| Spot | | | 2,900 | 56 | 1,700 | 42 | 588,900 | 9,889 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 200 | 4 | 64,200 | 1,541 | 118,400 | 2,072 | 763,000 | 17,909 |
| Spotted | | | | | | | 182,700 | 14,616 |
| Striped bass | 10,100 | 874 | 28,100 | 2,529 | 80,400 | 5,621 | 19,700 | 1,591 |
| Sturgeon | | | | | | | 3,700 | 443 |
| Swellfish | | | 500 | 42 | | | 9,800 | 180 |
| Tautog | | | | | | | 100 | 1 |
| Tomcod | | | | | | | 5,600 | 58 |
| White perch | 2,900 | 116 | 5,200 | 104 | 36,100 | 983 | 2,100 | 30 |
| Whiting | | | 300 | 6 | | | 7,900 | 130 |
| Yellow perch | | | | | 400 | 32 | | |
| Crabs: | | | | | | | | |
| Hard | | | 82,200 | 1,546 | 1,485,900 | 26,071 | 3,305,100 | 78,035 |
| Soft and peelers | | | 300 | 55 | 24,100 | 4,017 | 1,200 | 160 |
| Clams, hard, public | | | | | | | 393,600 | 30,746 |
| Oysters, market: | | | | | | | | |
| Public, spring | | | | | 272,000 | 19,040 | 3,000 | 220 |
| Public, fall | | | | | 380,000 | 30,400 | 4,200 | 310 |
| Private, spring | | | | | 84,000 | 5,880 | 227,400 | 19,363 |
| Private, fall | | | | | 54,000 | 4,320 | 506,800 | 37,851 |
| Squid | | | 1,200 | 18 | | | 10,900 | 166 |
| Total | 56,600 | 3,000 | 618,700 | 16,261 | 3,291,100 | 115,841 | 12,659,100 | 314,798 |

## SHAD AND ALEWIFE FISHERIES OF THE POTOMAC RIVER

The catch of shad in the Potomac River in 1938 amounted to 192,560 in number, 519,635 pounds in weight, and their total value to the fishermen was $47,385. The catch of alewives for the same season amounted to 9,248,000 in number, with a total weight of 3,695,200 pounds, and a value to the fishermen of $36,990. These figures show an increase of 19 percent in weight and 17 percent in the value of shad as compared with 1937, and an increase of 22 percent in weight and 27 percent in the value of alewives.

Approximately 84 percent of the shad, in weight, were taken with pound nets, and 16 percent with gill nets. Over 99 percent of the alewives were taken with pound nets, the remainder being taken with gill nets.

Statistics of the catch of shad and alewives in the Potomac River are also included in the catch data for Maryland and Virginia which are published elsewhere in this report.

*Shad and alewife fisheries of the Potomac River, 1938*

| Item | Maryland | | | Virginia | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | *Number* | *Pounds* | *Value* | *Number* | *Pounds* | *Value* | *Number* | *Pounds* | *Value* |
| Fishermen on boats and shore: | | | | | | | | | |
| Regular | 27 | | | 235 | | | 262 | | |
| Casual | 49 | | | 128 | | | 177 | | |
| Total | 76 | | | 363 | | | 439 | | |
| Boats: | | | | | | | | | |
| Motor | 35 | | | 127 | | | 162 | | |
| Other | 7 | | | 129 | | | 136 | | |
| Apparatus: | | | | | | | | | |
| Haul seines | 2 | | | | | | 2 | | |
| Length, yards | 200 | | | | | | 200 | | |
| Gill nets: | | | | | | | | | |
| Drift | 7 | | | 18 | | | 25 | | |
| Square yards | 16,632 | | | 14,560 | | | 31,192 | | |
| Stake | 1,022 | | | 639 | | | 1,661 | | |
| Square yards | 73,436 | | | 75,497 | | | 148,933 | | |
| Pound nets | 39 | | | 263 | | | 302 | | |
| Fyke nets | | | | 53 | | | 53 | | |
| Shad caught: | | | | | | | | | |
| With haul seines | 207 | 600 | $39 | | | | 207 | 600 | $39 |
| With drift gill nets | 4,475 | 14,300 | 1,331 | 12,845 | 39,700 | $4,130 | 17,320 | 54,000 | 5,461 |
| With stake gill nets | 2,160 | 6,500 | 758 | 8,467 | 22,800 | 2,262 | 10,627 | 29,300 | 3,020 |
| With pound nets | 10,136 | 29,835 | 3,058 | 154,137 | 405,600 | 35,777 | 164,273 | 435,435 | 38,835 |
| With fyke nets | | | | 133 | 300 | 30 | 133 | 300 | 30 |
| Total | 16,978 | 51,235 | 5,186 | 175,582 | 468,400 | 42,199 | 192,560 | 519,635 | 47,385 |
| Alewives caught: | | | | | | | | | |
| With drift gill nets | 5,000 | 2,000 | 20 | | | | 5,000 | 2,000 | 20 |
| With stake gill nets | 500 | 200 | 2 | 1,250 | 500 | 8 | 1,750 | 700 | 10 |
| With pound nets | 970,000 | 384,000 | 3,775 | 8,271,250 | 3,308,500 | 33,185 | 9,241,250 | 3,692,500 | 36,960 |
| Total | 975,500 | 386,200 | 3,797 | 8,272,500 | 3,309,000 | 33,193 | 9,248,000 | 3,695,200 | 36,990 |

## TRADE IN FISHERY PRODUCTS IN WASHINGTON, D. C.

The municipal fish wharf and market in Washington, D. C., is located in the southwestern part of the city on an arm of the Potomac River. At the present time 15 firms have stalls in this market, 3 are located in the immediate vicinity of the market, 2 have stalls in the market located at Fifth and K Streets NW., and 1 is located in another part of the city. Altogether there are 21 firms which employ 179 persons who received $206,071 in salaries and wages during 1938. These firms conduct mainly a wholesale business although some retail trade is carried on.

The facilities for handling fish and oysters from boats and vessels that may land at the wharf are good, but only a comparatively small quantity are brought into the city by this method. In the fall and winter, considerable quantities of shell oysters are landed, but most of the oysters handled in Washington are brought in already shucked from Maryland and Virginia by truck and other transportation facilities.

## FISHERIES OF THE SOUTH ATLANTIC AND GULF STATES

(South Atlantic, Area XXIV; Gulf, Area XXV) [10]

The yield of the commercial fisheries of the marine areas of the South Atlantic and Gulf States (North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas) during 1938 amounted to 621,858,100 pounds, valued at $13,073,403 to the fishermen, representing an increase of 14 percent in quantity but a decrease of 8 percent in value as compared with the catch of the previous year. These fisheries provided employment for 29,588 fishermen as compared with 30,244 in 1937.

There were 742 fishery wholesale and manufacturing establishments in these States in 1938, as compared with 725 in 1937. In 1938 these establishments employed 18,167 persons, paid $3,452,182 in salaries and wages, and produced manufactured products (canned, cured, packaged, and byproducts) valued at $11,762,783. In 1937 wholesale and manufacturing firms employed 18,534 persons, paid $3,863,777 in salaries and wages, and produced manufactured products valued at $15,110,653.

*Fisheries of the South Atlantic and Gulf States, 1938*

SUMMARY OF CATCH

| Product | North Carolina | | South Carolina | | Georgia | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Fish | 188, 426, 900 | $1, 587, 299 | 1, 578, 700 | $80, 104 | 7, 390, 800 | $41, 335 |
| Shellfish, etc | 10, 337, 700 | 362, 777 | 6, 331, 900 | 193, 894 | 12, 444, 800 | 339, 553 |
| Total | 198, 764, 600 | 1, 950, 076 | 7, 910, 600 | 273, 998 | 19, 835, 600 | 380, 888 |

| Product | Florida | | Alabama | | Mississippi | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Fish | 222, 349, 800 | $3, 318, 000 | 5, 402, 200 | $224, 236 | 1, 099, 600 | $62, 090 |
| Shellfish, etc | 19, 093, 100 | 1, 670, 084 | 5, 515, 100 | 225, 371 | 13, 160, 200 | 540, 929 |
| Total | 241, 442, 900 | 4, 988, 084 | 10, 917, 300 | 449, 607 | 14, 259, 800 | 603, 019 |

| Product | Louisiana | | Texas | | Total | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Fish | 1, 496, 100 | $104, 746 | 6, 152, 200 | $403, 949 | 433, 896, 300 | $5, 821, 759 |
| Shellfish, etc | 102, 387, 000 | 3, 286, 768 | 18, 692, 000 | 632, 268 | 187, 961, 800 | 7, 251, 644 |
| Total | 103, 883, 100 | 3, 391, 514 | 24, 844, 200 | 1, 036, 217 | 621, 858, 100 | 13, 073, 403 |

OPERATING UNITS: BY STATES

| Item | North Carolina | South Carolina | Georgia | Florida | Alabama | Mississippi | Louisiana | Texas | Total |
|---|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 1, 091 | 75 | 205 | 1, 283 | 235 | 980 | 468 | 228 | 4, 565 |
| On boats and shore: | | | | | | | | | |
| Regular | 4, 431 | 654 | 552 | 5, 975 | 652 | 1, 536 | 4, 412 | 1, 310 | 19, 522 |
| Casual | 1, 383 | 701 | 416 | 1, 467 | 253 | 129 | 525 | 627 | 5, 501 |
| Total | 6, 905 | 1, 430 | 1, 173 | 8, 725 | 1, 140 | 2, 645 | 5, 405 | 2, 165 | 29, 588 |
| Vessels: | | | | | | | | | |
| Motor | 166 | 23 | 74 | 226 | 47 | 240 | 196 | 70 | 1, 042 |
| Net tonnage | 2, 064 | 191 | 662 | 4, 025 | 527 | 2, 889 | 1, 580 | 718 | 12, 656 |
| Sail | 64 | 1 | | 1 | | 7 | | | 73 |
| Net tonnage | 580 | 12 | | 9 | | 90 | | | 691 |
| Total vessels | 230 | 24 | 74 | 227 | 47 | 247 | 196 | 70 | 1, 115 |
| Total net tonnage | 2, 644 | 203 | 662 | 4, 034 | 527 | 2, 979 | 1, 580 | 718 | 13, 347 |

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[10] These are the numbers given to these areas by the North American Council on Fishery Investigations The catch of the Mississippi River and tributaries is not included in this section.

*Fisheries of the South Atlantic and Gulf States, 1938*—Continued

OPERATING UNITS: BY STATES—Continued

| Item | North Carolina | South Carolina | Georgia | Florida | Alabama | Mississippi | Louisiana | Texas | Total |
|---|---|---|---|---|---|---|---|---|---|
| Boats: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Motor | 1,298 | 48 | 188 | 2,562 | 252 | 444 | 1,734 | 606 | 7,132 |
| Other | 1,802 | 591 | 428 | 3,462 | 415 | 608 | 1,395 | 382 | 9,083 |
| Accessory boats | 152 | 10 | 6 | 51 | 10 | ---- | ---- | ---- | 229 |
| Apparatus: | | | | | | | | | |
| Purse seines, menhaden | 35 | ---- | 2 | 19 | ---- | ---- | ---- | ---- | 56 |
| Length, yards | 8,655 | ---- | 600 | 5,320 | ---- | ---- | ---- | ---- | 14,575 |
| Haul seines: | | | | | | | | | |
| Common | 394 | 38 | 10 | 238 | 6 | 6 | 74 | 45 | 811 |
| Length, yards | 84,255 | 6,185 | 898 | 124,315 | 3,600 | 2,400 | 29,400 | 15,135 | 266,188 |
| Long | 91 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 91 |
| Length, yards | 90,900 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 90,900 |
| Gill nets: | | | | | | | | | |
| Anchor | 1,755 | 106 | 16 | 18 | ---- | ---- | ---- | ---- | 1,895 |
| Square yards | 909,477 | 67,880 | 770 | 13,500 | ---- | ---- | ---- | ---- | 991,627 |
| Drift | 106 | 35 | 96 | 71 | ---- | ---- | ---- | ---- | 308 |
| Square yards | 140,100 | 49,710 | 43,110 | 88,700 | ---- | ---- | ---- | ---- | 321,620 |
| Runaround | 538 | 49 | 28 | 2,198 | ---- | ---- | ---- | 114 | 2,927 |
| Square yards | 377,945 | 22,770 | 8,480 | 2,325,660 | ---- | ---- | ---- | 26,850 | 2,761,705 |
| Stake | 4,647 | 16 | 142 | 4 | 10 | ---- | ---- | 343 | 5,162 |
| Square yards | 306,020 | 10,925 | 15,665 | 3,600 | 2,000 | ---- | ---- | 81,925 | 420,135 |
| Trammel nets | ---- | ---- | ---- | 621 | 167 | 60 | 30 | 107 | 985 |
| Square yards | ---- | ---- | ---- | 519,745 | 87,160 | 31,500 | 8,500 | 55,850 | 702,755 |
| Lines: | | | | | | | | | |
| Hand | 120 | 98 | 150 | 1,965 | 116 | 108 | 282 | 380 | 3,219 |
| Hooks and baits | 141 | 130 | 150 | 2,600 | 202 | 128 | 351 | 495 | 4,197 |
| Trawl | ---- | ---- | ---- | 35 | ---- | ---- | ---- | ---- | 35 |
| Hooks | ---- | ---- | ---- | 2,040 | ---- | ---- | ---- | ---- | 2,040 |
| Troll | 26 | 8 | ---- | 995 | ---- | 4 | ---- | 6 | 1,039 |
| Hooks | 26 | 8 | ---- | 995 | ---- | 4 | ---- | 6 | 1,039 |
| Trots with baits or snoods | 654 | 125 | 202 | 151 | 87 | 106 | 651 | 43 | 2,019 |
| Baits or snoods | 408,000 | 35,848 | 82,300 | 83,550 | 46,650 | 88,500 | 184,005 | 18,560 | 947,413 |
| Trot with hooks | 20 | ---- | 45 | 219 | 77 | ---- | ---- | 96 | 457 |
| Hooks | 1,950 | ---- | 5,325 | 76,155 | 23,100 | ---- | ---- | 66,000 | 172,530 |
| Pound nets | 2,738 | ---- | ---- | 24 | ---- | ---- | ---- | ---- | 2,762 |
| Wheels | 6 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 6 |
| Fyke nets | 527 | ---- | ---- | 8 | 130 | ---- | ---- | ---- | 665 |
| Dip nets: | | | | | | | | | |
| Common | 439 | 6 | ---- | 57 | ---- | ---- | 37 | 52 | 591 |
| Drop | ---- | ---- | ---- | 24 | ---- | 58 | 6,775 | ---- | 6,857 |
| Cast nets | ---- | 26 | ---- | 205 | ---- | 18 | ---- | ---- | 249 |
| Otter trawls, shrimp | 169 | 40 | 229 | 319 | 149 | 580 | 1,545 | 432 | 3,463 |
| Yards at mouth | 2,902 | 814 | 4,657 | 6,124 | 2,089 | 9,245 | 21,492 | 6,391 | 53,714 |
| Traps, brush | ---- | ---- | ---- | ---- | ---- | ---- | 29,600 | ---- | 29,600 |
| Pots: | | | | | | | | | |
| Sea crawfish | ---- | ---- | ---- | 2,050 | ---- | ---- | ---- | ---- | 2,050 |
| Crab | ---- | ---- | 620 | 6,890 | ---- | ---- | ---- | 934 | 8,444 |
| Eel | 1,679 | ---- | ---- | 71 | ---- | ---- | ---- | ---- | 1,750 |
| Fish | 16 | 105 | 44 | 5,110 | 380 | ---- | ---- | ---- | 5,655 |
| Spears | 322 | 97 | ---- | 157 | 59 | 59 | ---- | 161 | 855 |
| Dredges: | | | | | | | | | |
| Clam | ---- | ---- | ---- | 1 | ---- | ---- | ---- | ---- | 1 |
| Oyster | 274 | 1 | ---- | 10 | 37 | 368 | 116 | 58 | 864 |
| Yards at mouth | 260 | 2 | ---- | 10 | 38 | 369 | 115 | 58 | 852 |
| Scallop | ---- | ---- | ---- | 54 | ---- | ---- | ---- | ---- | 54 |
| Yards at mouth | ---- | ---- | ---- | 50 | ---- | ---- | ---- | ---- | 50 |
| Tongs, oyster | 160 | ---- | 22 | 331 | 521 | 639 | 703 | 166 | 2,542 |
| Rakes, other than for oysters | 660 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 660 |
| Forks | ---- | ---- | ---- | 11 | ---- | ---- | ---- | ---- | 11 |
| Grabs | ---- | 176 | 30 | 21 | ---- | ---- | ---- | ---- | 227 |
| Coquina scoops | ---- | ---- | ---- | 4 | ---- | ---- | ---- | ---- | 4 |
| Hooks: | | | | | | | | | |
| Sponge | ---- | ---- | ---- | 292 | ---- | ---- | ---- | ---- | 292 |
| Stone crab | ---- | ---- | ---- | 10 | ---- | ---- | ---- | ---- | 10 |
| Diving outfits | ---- | ---- | ---- | 72 | ---- | ---- | ---- | ---- | 72 |

*Fisheries of the South Atlantic and Gulf States, 1938*—Continued

CATCH: BY STATES

| Species | North Carolina | | South Carolina | | Georgia | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| FISH | | | | | | |
| Alewives | 11,219,100 | $112,211 | | | | |
| Bluefish | 1,849,000 | 96,508 | 42,600 | $3,213 | | |
| Bonito | 10,500 | 206 | 300 | 9 | | |
| Bowfin | 5,000 | 54 | | | | |
| Butterfish | 15,100 | 453 | | | | |
| Cabio or crab eater | 200 | 8 | | | | |
| Carp | 224,500 | 2,932 | | | | |
| Catfish and bullheads | 717,900 | 21,392 | 73,000 | 2,490 | 39,100 | $1,726 |
| Crappie | 7,900 | 119 | | | | |
| Croaker | 6,475,100 | 91,373 | 1,100 | 33 | 2,500 | 100 |
| Drum: | | | | | | |
| Black | 74,700 | 2,988 | 28,000 | 1,060 | 5,000 | 200 |
| Red or redfish | 530,100 | 18,000 | 103,500 | 5,820 | 27,500 | 1,275 |
| Eels, common | 111,900 | 3,806 | | | 1,500 | 165 |
| Flounders | 501,400 | 25,000 | 65,500 | 5,140 | 8,000 | 385 |
| Gizzard shad | 63,200 | 913 | | | | |
| Grunts | | | 2,500 | 75 | | |
| Harvestfish or "starfish" | 428,700 | 12,941 | | | | |
| Hickory shad | 111,100 | 2,479 | 8,500 | 200 | 4,000 | 135 |
| Hogfish | 29,600 | 715 | | | | |
| King whiting or "kingfish" | 1,573,200 | 47,464 | 86,000 | 2,970 | 75,000 | 1,125 |
| Menhaden | 146,819,000 | 426,503 | | | 7,033,800 | 9,888 |
| Mullet | 3,276,100 | 127,959 | 587,000 | 22,785 | 17,000 | 415 |
| Pigfish | 21,400 | 424 | | | | |
| Pike or pickerel | 800 | 12 | | | | |
| Pinfish or sailors choice | 600 | 11 | | | | |
| Pompano | 20,300 | 2,030 | | | | |
| Porgies | 900 | 18 | 1,000 | 13 | | |
| Sea bass | 66,400 | 3,320 | 111,500 | 6,265 | | |
| Sea catfish | | | 100,000 | 3,000 | | |
| Shad | 1,031,800 | 164,571 | 59,400 | 12,010 | 98,100 | 17,979 |
| Sharks | 581,400 | 1,744 | | | | |
| Sheepshead, salt-water | 20,300 | 450 | 2,900 | 65 | 5,000 | 150 |
| Snapper, red | 1,200 | 60 | | | | |
| Spadefish | 6,200 | 184 | | | | |
| Spanish mackerel | 270,600 | 13,520 | | | | |
| Spot | 5,737,800 | 88,677 | 195,800 | 4,636 | 4,000 | 80 |
| Squeteagues or "sea trout": | | | | | | |
| Gray | 5,094,900 | 195,849 | 5,000 | 350 | | |
| Spotted | 848,000 | 67,131 | 78,800 | 7,359 | 62,500 | 6,250 |
| Striped bass | 522,700 | 48,628 | 600 | 108 | | |
| Sturgeon | 400 | 4 | 25,700 | 2,503 | 7,800 | 1,462 |
| Suckers | 1,800 | 32 | | | | |
| Tautog | 900 | 45 | | | | |
| Tuna | 600 | 18 | | | | |
| White perch | 145,500 | 6,212 | | | | |
| Yellow perch | 9,100 | 335 | | | | |
| Total | 188,426,900 | 1,587,299 | 1,578,700 | 80,104 | 7,390,800 | 41,335 |
| SHELLFISH, ETC. | | | | | | |
| Crabs: | | | | | | |
| Hard [1] | 3,829,700 | 72,455 | 843,300 | 15,168 | 1,354,200 | 27,828 |
| Soft and peelers | 124,400 | 18,652 | 4,800 | 216 | | |
| Shrimp | 4,569,100 | 137,469 | 3,722,800 | 111,807 | 10,425,700 | 302,261 |
| Clams: | | | | | | |
| Hard, public [2] | 342,500 | 26,570 | | | | |
| Hard, private [2] | 15,400 | 1,186 | | | | |
| Oysters, market: [3] | | | | | | |
| Public, spring | 519,200 | 30,339 | | | | |
| Public, fall | 894,700 | 67,269 | | | | |
| Private, spring | 9,000 | 540 | 964,800 | 35,973 | 87,100 | 4,566 |
| Private, fall | 4,000 | 320 | 796,200 | 30,730 | 66,900 | 3,472 |
| Scallops, bay | 29,500 | 7,971 | | | | |
| Terrapin, diamond-back | | | | | 10,900 | 1,426 |
| Turtles, snapper | 200 | 6 | | | | |
| Total | 10,337,700 | 362,777 | 6,331,900 | 193,894 | 12,444,800 | 339,553 |
| Grand total | 198,764,600 | 1,950,076 | 7,910,600 | 273,998 | 19,835,600 | 380,888 |

See footnotes at end of table.

## *Fisheries of the South Atlantic and Gulf States, 1938*—Continued

### CATCH: BY STATES—Continued

| Species | Florida | | Alabama | | Mississippi | |
|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 391,600 | $1,959 | | | | |
| Amberjack | 24,400 | 541 | | | | |
| Angelfish | 1,200 | 32 | | | | |
| Barracuda | 500 | 20 | | | | |
| Bluefish | 4,480,000 | 205,316 | 21,200 | $1,075 | | |
| Blue runner or hardtail | 731,700 | 9,080 | 17,700 | 356 | | |
| Buffalofish | | | 59,900 | 2,397 | | |
| Cabio or crab eater | 7,400 | 198 | | | | |
| Catfish and bullheads | 4,057,500 | 147,539 | 73,600 | 5,152 | | |
| Cigarfish | 9,000 | 180 | | | | |
| Crappie | 552,700 | 19,052 | | | | |
| Crevalle | 190,500 | 3,516 | | | | |
| Croaker | 13,000 | 254 | 53,100 | 1,066 | 13,700 | $411 |
| Dolphin | 2,600 | 123 | | | | |
| Drum: | | | | | | |
| Black | 63,700 | 1,682 | 5,000 | 221 | 7,900 | 237 |
| Red or redfish | 1,122,000 | 36,875 | 31,800 | 1,592 | 106,000 | 6,546 |
| Eels, common | 9,800 | 243 | | | | |
| Flounders | 190,000 | 8,769 | 64,600 | 5,980 | 42,300 | 4,071 |
| Groupers | 4,396,300 | 138,412 | 222,300 | 6,812 | 157,600 | 4,370 |
| Grunts | 51,300 | 1,268 | | | | |
| Hickory shad | 32,400 | 1,176 | | | | |
| Hogfish | 15,800 | 590 | | | | |
| Jewfish | 128,400 | 4,559 | | | | |
| Kingfish or "king mackerel" | 3,665,200 | 136,377 | | | | |
| King whiting or "kingfish" | 330,800 | 5,525 | 300 | 15 | 3,700 | 111 |
| Menhaden | 149,269,100 | 388,076 | | | | |
| Mojarra | 333,500 | 7,809 | | | | |
| Moonfish | 300 | 6 | | | | |
| Mullet | 28,593,900 | 941,260 | 3,364,500 | 91,715 | 284,600 | 8,438 |
| Muttonfish | 282,900 | 17,559 | | | | |
| Paddlefish or "spoonbill cat" | | | 40,100 | 3,558 | | |
| Permit | 15,700 | 340 | | | | |
| Pigfish | 49,200 | 775 | | | | |
| Pinfish or sailors choice | 23,700 | 299 | | | | |
| Pompano | 778,100 | 161,631 | 1,500 | 296 | 600 | 90 |
| Porgies | 57,900 | 1,965 | | | | |
| Sea bass | 25,400 | 970 | | | | |
| Sea catfish | 67,700 | 1,333 | 10,200 | 245 | 2,200 | 54 |
| Shad | 228,700 | 21,779 | | | | |
| Sharks | 3,100,600 | 22,335 | | | | |
| Sheepshead: | | | | | | |
| Fresh-water | | | 4,700 | 235 | | |
| Salt-water | 779,500 | 21,554 | 58,700 | 2,798 | 19,700 | 981 |
| Snappers: | | | | | | |
| Lane | 2,200 | 110 | | | | |
| Mangrove | 295,600 | 9,473 | | | | |
| Red | 5,377,900 | 378,433 | 1,193,100 | 85,388 | 173,900 | 12,173 |
| Snook or sergeantfish | 610,100 | 20,994 | | | | |
| Spadefish | 5,100 | 102 | | | | |
| Spanish mackerel | 6,835,400 | 314,522 | 39,000 | 3,071 | 2,000 | 255 |
| Spot | 229,000 | 5,893 | 3,500 | 70 | 1,000 | 30 |
| Squeteagues or "sea trout": | | | | | | |
| Spotted | 3,413,200 | 219,796 | 119,400 | 11,670 | 249,000 | 23,266 |
| White | 54,400 | 2,188 | 5,100 | 132 | 35,300 | 1,054 |
| Sturgeon | 36,000 | 3,220 | 2,330 | 181 | | |
| Sunfish | 867,800 | 31,018 | | | | |
| Swellfish | 1,000 | 80 | | | | |
| Tenpounder | 359,200 | 6,854 | 10,600 | 211 | | |
| Tripletail | 18,100 | 291 | | | 100 | 3 |
| Turbot | 1,800 | 36 | | | | |
| Yellowtail | 169,000 | 14,013 | | | | |
| Total | 222,349,800 | 3,318,000 | 5,402,200 | 224,236 | 1,099,600 | 62,090 |
| SHELLFISH, ETC. | | | | | | |
| Crabs: | | | | | | |
| Hard [1] | 5,594,900 | 76,270 | 510,700 | 7,630 | 1,016,400 | 17,296 |
| Stone | 54,500 | 11,998 | | | | |
| Sea crawfish or spiny lobster | 328,400 | 23,377 | | | | |
| Shrimp | 10,142,600 | 318,612 | 3,643,500 | 145,740 | 9,902,400 | 420,549 |
| Clams: | | | | | | |
| Coquina | 16,000 | 300 | | | | |
| Hard, public [3] | 747,000 | 72,144 | | | | |
| Conchs | 7,800 | 624 | | | | |

See footnotes at end of table.

## *Fisheries of the South Atlantic and Gulf States, 1938*—Continued

### CATCH: BY STATES—Continued

| Species | Florida | | Alabama | | Mississippi | |
|---|---|---|---|---|---|---|
| SHELLFISH, ETC.—continued | | | | | | |
| Oysters, market:[3] | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Public, spring | 341, 500 | $22, 291 | 473, 300 | $23, 637 | 2, 042, 500 | $91, 793 |
| Public, fall | 558, 100 | 42, 538 | 788, 700 | 41, 812 | 198, 900 | 11, 291 |
| Private, spring | 130, 200 | 7, 287 | 55, 600 | 3, 340 | | |
| Private, fall | 130, 700 | 7, 272 | 41, 100 | 2, 992 | | |
| Scallops, bay | 137, 400 | 10, 593 | | | | |
| Terrapin, diamond-back | | | 2, 200 | 220 | | |
| Turtles: | | | | | | |
| Green | 8, 200 | 310 | | | | |
| Loggerhead | 800 | 16 | | | | |
| Soft-shell | 289, 000 | 5, 604 | | | | |
| Sponges: | | | | | | |
| Grass | 16, 900 | 12, 603 | | | | |
| Sheepswool | 472, 200 | 997, 338 | | | | |
| Wire | 7, 900 | 6, 514 | | | | |
| Yellow | 109, 000 | 54, 393 | | | | |
| Total | 19, 093, 100 | 1, 670, 084 | 5, 515, 100 | 225, 371 | 13, 160, 200 | 540, 929 |
| Grand total | 241, 442, 900 | 4, 988, 084 | 10, 917, 300 | 449, 607 | 14, 259, 800 | 603, 019 |

| Species | Louisiana | | Texas | | Total | |
|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | 11, 610, 700 | $114, 170 |
| Amberjack | | | | | 24, 400 | 541 |
| Angelfish | | | | | 1, 200 | 32 |
| Barracuda | | | | | 500 | 20 |
| Bluefish | | | | | 6, 392, 800 | 306, 112 |
| Blue runner or hardtail | | | | | 749, 400 | 9, 436 |
| Bonito | | | | | 10, 800 | 215 |
| Bowfin | | | | | 5, 000 | 54 |
| Buffalofish | | | | | 59, 900 | 2, 397 |
| Butterfish | | | | | 15, 100 | 453 |
| Cabio or crab eater | | | | | 7, 600 | 206 |
| Carp | | | | | 224, 500 | 2, 932 |
| Catfish and bullheads | | | | | 4, 961, 100 | 178, 299 |
| Cigarfish | | | | | 9, 000 | 180 |
| Crappie | | | | | 560, 600 | 19, 171 |
| Crevalle | | | | | 190, 500 | 3, 516 |
| Croaker | 78, 200 | $2, 647 | 55, 200 | $1, 534 | 6, 691, 900 | 97, 418 |
| Dolphin | | | | | 2, 600 | 123 |
| Drum: | | | | | | |
| Black | 117, 200 | 4, 640 | 1, 557, 500 | 45, 250 | 1, 859, 000 | 56, 278 |
| Red or redfish | 522, 000 | 38, 054 | 859, 800 | 64, 907 | 3, 302, 700 | 173, 069 |
| Eels, common | | | | | 123, 200 | 4, 214 |
| Flounders | 36, 900 | 2, 722 | 126, 500 | 12, 143 | 1, 035, 200 | 64, 210 |
| Gizzard shad | | | | | 63, 200 | 913 |
| Groupers | 6, 000 | 180 | 31, 600 | 1, 002 | 4, 813, 800 | 150, 776 |
| Grunts | | | | | 53, 800 | 1, 343 |
| Harvestfish or "starfish" | | | | | 428, 700 | 12, 941 |
| Hickory shad | | | | | 156, 000 | 3, 990 |
| Hogfish | | | | | 45, 400 | 1, 305 |
| Jewfish | | | 7, 900 | 238 | 136, 300 | 4, 797 |
| Kingfish or "king mackerel" | | | 1, 900 | 76 | 3, 667, 100 | 136, 453 |
| King whiting or "kingfish" | 4, 000 | 151 | 11, 000 | 448 | 2, 084, 000 | 57, 809 |
| Menhaden | | | | | 303, 121, 900 | 824, 467 |
| Mojarra | | | | | 333, 500 | 7, 809 |
| Moonfish | | | | | 300 | 6 |
| Mullet | 11, 800 | 392 | 4, 300 | 155 | 36, 139, 200 | 1, 193, 119 |
| Muttonfish | | | | | 282, 900 | 17, 559 |
| Paddlefish or "spoonbill cat" | | | | | 40, 100 | 3, 558 |
| Permit | | | | | 15, 700 | 340 |
| Pigfish | | | | | 70, 600 | 1, 199 |
| Pike or pickerel | | | | | 800 | 12 |
| Pinfish or sailors choice | | | | | 24, 300 | 310 |
| Pompano | 500 | 90 | 5, 500 | 1, 058 | 806, 500 | 165, 195 |
| Porgies | | | | | 59, 800 | 1, 996 |
| Sea bass | | | | | 203, 300 | 10, 555 |
| Sea catfish | 5, 700 | 136 | 35, 100 | 1, 059 | 220, 900 | 5, 827 |
| Shad | | | | | 1, 418, 000 | 216, 339 |
| Sharks | | | | | 3, 682, 000 | 24, 079 |
| Sheepshead: | | | | | | |
| Fresh-water | | | | | 4, 700 | 235 |
| Salt-water | 69, 000 | 3, 653 | 20, 800 | 1, 118 | 975, 900 | 30, 769 |

See footnotes at end of table.

## *Fisheries of the South Atlantic and Gulf States, 1938*—Continued

### CATCH: BY STATES—Continued

| Species | Louisiana | | Texas | | Total | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| FISH—continued | | | | | | |
| Snappers: | | | | | | |
| Lane | | | | | 2, 200 | $110 |
| Mangrove | | | | | 295, 600 | 9, 473 |
| Red | 85, 000 | $5, 600 | 1, 279, 000 | $103, 902 | 8, 110, 100 | 585, 556 |
| Snook or sergeantfish | | | 6, 800 | 422 | 616, 900 | 21, 416 |
| Spadefish | | | | | 11, 300 | 286 |
| Spanish mackerel | 16, 400 | 1, 760 | 61, 900 | 3, 938 | 7, 225, 300 | 337, 066 |
| Spot | 4, 800 | 188 | 4, 200 | 136 | 6, 180, 100 | 99, 710 |
| Squeteagues or "sea trout": | | | | | | |
| Gray | | | | | 5, 099, 900 | 196, 199 |
| Spotted | 490, 200 | 42, 637 | 1, 977, 500 | 163, 291 | 7, 238, 600 | 541, 400 |
| White | 48, 400 | 1, 896 | 105, 700 | 3, 272 | 248, 900 | 8, 542 |
| Striped bass | | | | | 523, 300 | 48, 736 |
| Sturgeon | | | | | 72, 200 | 7, 370 |
| Suckers | | | | | 1, 800 | 32 |
| Sunfish | | | | | 867, 800 | 31, 018 |
| Swellfish | | | | | 1, 000 | 80 |
| Tautog | | | | | 900 | 45 |
| Tenpounder | | | | | 369, 800 | 7, 065 |
| Tripletail | | | | | 18, 200 | 294 |
| Tuna | | | | | 600 | 18 |
| Turbot | | | | | 1, 800 | 36 |
| White perch | | | | | 145, 500 | 6, 212 |
| Yellow perch | | | | | 9, 100 | 335 |
| Yellowtail | | | | | 169, 000 | 14, 013 |
| Total | 1, 496, 100 | 104, 746 | 6, 152, 200 | 403, 949 | 433, 896, 300 | 5, 821, 759 |
| SHELLFISH, ETC. | | | | | | |
| Crabs: | | | | | | |
| Hard [1] | 10, 533, 200 | 106, 464 | 971, 400 | 23, 850 | 25, 153, 800 | 346, 961 |
| Soft and peelers | 247, 700 | 36, 899 | | | 376, 900 | 55, 767 |
| Stone | | | | | 54, 500 | 11, 998 |
| Sea crawfish or spiny lobster | | | | | 328, 400 | 23, 377 |
| Shrimp | 81, 378, 900 | 2, 602, 736 | 16, 364, 700 | 505, 757 | 140, 149, 700 | 4, 544, 931 |
| Clams: | | | | | | |
| Coquina | | | | | 16, 000 | 300 |
| Hard, public [2] | | | | | 1, 089, 500 | 98, 714 |
| Hard, private [2] | | | | | 15, 400 | 1, 186 |
| Conchs | | | | | 7, 800 | 624 |
| Oysters, market: [3] | | | | | | |
| Public, spring | 4, 440, 300 | 187, 847 | 555, 100 | 41, 724 | 8, 371, 900 | 397, 631 |
| Public, fall | 1, 651, 800 | 74, 309 | 614, 000 | 45, 888 | 4, 706, 200 | 283, 107 |
| Private, spring | 3, 079, 900 | 200, 443 | 79, 000 | 6, 344 | 4, 405, 600 | 258, 493 |
| Private, fall | 1, 050, 300 | 77, 135 | 107, 800 | 8, 705 | 2, 197, 000 | 130, 626 |
| Scallops, bay | | | | | 166, 900 | 18, 564 |
| Terrapin, diamond-back | 4, 900 | 935 | | | 18, 000 | 2, 581 |
| Turtles: | | | | | | |
| Green | | | | | 8, 200 | 310 |
| Loggerhead | | | | | 800 | 16 |
| Snapper | | | | | 200 | 6 |
| Soft-shell | | | | | 289, 000 | 5, 604 |
| Sponges: | | | | | | |
| Grass | | | | | 16, 900 | 12, 603 |
| Sheepswool | | | | | 472, 200 | 997, 338 |
| Wire | | | | | 7, 900 | 6, 514 |
| Yellow | | | | | 109, 000 | 54, 393 |
| Total | 102, 387, 000 | 3, 286, 768 | 18, 692, 000 | 632, 268 | 187, 961, 800 | 7, 251, 644 |
| Grand total | 103, 883, 100 | 3, 391, 514 | 24, 844, 200 | 1, 036, 217 | 621, 858, 100 | 13, 073, 403 |

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[1] Statistics on hard crabs used in this table are based on weights of 4 pounds per dozen in North Carolina; 6 pounds in South Carolina and Georgia; 5.79 pounds in Florida; 5 pounds in Alabama; 5.75 pounds in Mississippi; 5.66 pounds in Louisiana; and 5.71 pounds in Texas.

[2] Statistics on hard clams used in this table are based on yields of 6.14 pounds of meats per standard bushel in North Carolina, and 5.04 pounds in Florida.

[3] Statistics on oysters used in this table are based on yields of 4.27 pounds of meats per standard bushel in North Carolina; 3.16 pounds in South Carolina; 2.75 pounds in Georgia; 3.17 pounds in Florida; 3.81 pounds in Alabama; 4.03 pounds in Mississippi; 4.63 pounds in Louisiana; and 3.49 pounds in Texas.

NOTE.—Data on the yield of shellfish meats per bushel are based on U. S. standard bushels of 2,150.4 cubic inches capacity. Prior to 1938 yields were based on bushels of the size prescribed by individual State regulations.

The catch for Louisiana includes the following products taken by Mississippi craft in Louisiana waters: Shrimp, 7,403,400 pounds, valued at $315,097; oysters, market, spring, 3,751,400 pounds of meats, valued at $147,863; and oysters, market, fall, 1,462,700 pounds of meats, valued at $61,626. Prior to 1938 similar catches were included with the catch for Mississippi.

## *Fisheries of the South Atlantic and Gulf States, 1938*—Continued

### SUPPLEMENTARY TABLE SHOWING THE PRODUCTION OF CERTAIN SHELLFISH IN NUMBER AND BUSHELS

| Product | North Carolina | | South Carolina | | Georgia | |
|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Crabs: | | | | | | |
| Hard...number.. | 11,489,100 | $72,455 | 1,686,600 | $15,168 | 3,708,400 | $27,828 |
| Soft and peelers...do.... | 870,800 | 18,652 | 33,600 | 216 | | |
| Clams: | | | | | | |
| Hard, public...bushels.. | 55,782 | 26,570 | | | | |
| Hard, private...do.... | 2,508 | 1,186 | | | | |
| Oysters, market: | | | | | | |
| Public, spring...do.... | 121,593 | 30,339 | | | | |
| Public, fall...do.... | 209,532 | 67,269 | | | | |
| Private, spring...do.... | 2,108 | 540 | 305,316 | 35,973 | 31,673 | 4,566 |
| Private, fall...do.... | 937 | 320 | 251,962 | 30,730 | 24,327 | 3,472 |
| Scallops, bay...do.... | 4,805 | 7,971 | | | | |

| Product | Florida | | Alabama | | Mississippi | |
|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Crabs: | | | | | | |
| Hard...number.. | 11,595,648 | $76,270 | 1,225,680 | $7,630 | 2,119,416 | $17,296 |
| Stone...do.... | 51,444 | 11,998 | | | | |
| Clams, hard, public...bushels.. | 148,214 | 72,144 | | | | |
| Oysters, market: | | | | | | |
| Public, spring...do.... | 107,729 | 22,291 | 124,226 | 23,637 | 506,823 | 91,793 |
| Public, fall...do.... | 176,057 | 42,538 | 207,008 | 41,812 | 49,355 | 11,291 |
| Private, spring...do.... | 41,073 | 7,287 | 14,593 | 3,340 | | |
| Private, fall...do.... | 41,230 | 7,272 | 10,787 | 2,992 | | |
| Scallops, bay...do.... | 45,953 | 10,593 | | | | |

| Product | Louisiana | | Texas | | Total | |
|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Crabs: | | | | | | |
| Hard...number.. | 22,404,803 | $106,464 | 2,041,248 | $23,850 | 56,270,965 | $346,961 |
| Soft and peelers...do.... | 671,551 | 36,899 | | | 1,575,951 | 55,767 |
| Stone...do.... | | | | | 51,444 | 11,998 |
| Clams: | | | | | | |
| Hard, public...bushels.. | | | | | 203,996 | 98,714 |
| Hard, private...do.... | | | | | 2,508 | 1,186 |
| Oysters, market: | | | | | | |
| Public, spring...do.... | 959,028 | 187,847 | 159,054 | 41,724 | 1,978,453 | 397,631 |
| Public, fall...do.... | 356,760 | 74,309 | 175,931 | 45,888 | 1,174,643 | 283,107 |
| Private, spring...do.... | 665,205 | 200,443 | 22,636 | 6,344 | 1,082,604 | 258,493 |
| Private, fall...do.... | 226,847 | 77,135 | 30,888 | 8,705 | 586,978 | 130,626 |
| Scallops, bay...do.... | | | | | 50,758 | 18,564 |

NOTE.—Bushels represent U. S. Standard Bushels of 2,150.4 cubic inches capacity. Prior to 1938, data on bushels of shellfish were based on bushel measures of the size prescribed by individual State regulations. For more detailed information concerning shellfish measures the reader is referred to the section on conversion factors published on p. 548 of this document.

## *Industries related to the fisheries of the South Atlantic and Gulf States, 1938*

### OPERATING UNITS, SALARIES, AND WAGES

| Item | North Carolina | South Carolina | Georgia | Florida | Alabama | Mississippi | Louisiana | Texas | Total |
|---|---|---|---|---|---|---|---|---|---|
| Transporting: | | | | | | | | | |
| Persons engaged: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels... | 77 | 117 | | 42 | | 7 | 82 | | 325 |
| On boats... | 12 | 2 | | 84 | | | 90 | | 188 |
| Total... | 89 | 119 | | 126 | | 7 | 172 | | 513 |
| Vessels: | | | | | | | | | |
| Motor... | 41 | 13 | | 24 | | 3 | 40 | | 121 |
| Net tonnage.. | 344 | 169 | | 269 | | 18 | 327 | | 1,127 |
| Sail... | 1 | 32 | | 3 | | | | | 36 |
| Net tonnage.. | 6 | 313 | | 40 | | | | | 359 |
| Total vessels... | 42 | 45 | | 27 | | 3 | 40 | | 157 |
| Total net tonnage... | 350 | 482 | | 309 | | 18 | 327 | | 1,486 |

*Industries related to the fisheries of the South Atlantic and Gulf States, 1938*—Con.

OPERATING UNITS, SALARIES, AND WAGES—Continued

| Item | North Carolina | South Carolina | Georgia | Florida | Alabama | Mississippi | Louisiana | Texas | Total |
|---|---|---|---|---|---|---|---|---|---|
| Transporting—Con. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Boats | 8 | 2 | -------- | 83 | -------- | -------- | 45 | -------- | 138 |
| Wholesale and manufacturing: | | | | | | | | | |
| Establishments | 116 | 23 | 27 | 343 | 27 | 35 | 125 | 46 | 742 |
| Persons engaged: | | | | | | | | | |
| Proprietors | 130 | 16 | 21 | 379 | 30 | 23 | 118 | 53 | 770 |
| Salaried employees | 44 | 35 | 32 | 210 | 20 | 56 | 137 | 41 | 575 |
| Wage earners: | | | | | | | | | |
| Average for season | 1,847 | 1,299 | 1,462 | 2,168 | 501 | 2,416 | 5,735 | 1,394 | 16,822 |
| Average for year | 560 | 452 | 710 | 971 | 161 | 718 | 1,502 | 396 | 5,470 |
| Paid to salaried employees | $86,121 | $43,500 | $59,673 | $316,852 | $27,394 | $88,500 | $169,585 | $37,600 | $829,225 |
| Paid to wage earners | $284,232 | $117,108 | $194,002 | $615,522 | $91,525 | $353,274 | $773,644 | $193,650 | $2,622,957 |
| Total salaries and wages | $370,353 | $160,608 | $253,675 | $932,374 | $118,919 | $441,774 | $943,229 | $231,250 | $3,452,182 |
| Fishermen manufacturing | 582 | 27 | 17 | 343 | 97 | 128 | -------- | 129 | 1,323 |

PRODUCTS MANUFACTURED

| Item | North Carolina | | South Carolina | | Georgia | | Florida | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments: | | | | | | | | |
| Alewives: | | | | | | | | |
| Corned ... pounds | 3,191,250 | $62,625 | -------- | -------- | -------- | -------- | -------- | -------- |
| Corned with roe ... do | 52,300 | 2,012 | -------- | -------- | -------- | -------- | -------- | -------- |
| Roe, canned ... standard cases | 8,538 | 37,153 | -------- | -------- | -------- | -------- | -------- | -------- |
| Blue runner, salted ... pounds | -------- | -------- | -------- | -------- | -------- | -------- | 325,800 | $12,962 |
| Grouper: | | | | | | | | |
| Fresh steaks ... do | -------- | -------- | -------- | -------- | -------- | -------- | 401,130 | 66,261 |
| Fresh fillets ... do | -------- | -------- | -------- | -------- | -------- | -------- | 52,000 | 8,350 |
| Menhaden products: | | | | | | | | |
| Oil ... gallons | 1,301,042 | 346,638 | -------- | -------- | (1) | (1) | 231,356 | 60,743 |
| Meal ... tons | 3,891 | 170,807 | -------- | -------- | -------- | -------- | 2,922 | 120,769 |
| Acid scrap ... do | 7,176 | 133,481 | -------- | -------- | (1) | (1) | 4,964 | 94,424 |
| Dry scrap ... do | 10,447 | 423,445 | -------- | -------- | -------- | -------- | 4,681 | 179,188 |
| Mullet: | | | | | | | | |
| Salted ... pounds | 384,800 | 30,784 | -------- | -------- | -------- | -------- | 599,200 | 32,212 |
| Roe, salted ... do | -------- | -------- | -------- | -------- | -------- | -------- | 36,300 | 8,611 |
| Spanish mackerel, salted ... pounds | -------- | -------- | -------- | -------- | -------- | -------- | 88,000 | 4,973 |
| Spot, salted ... do | 96,600 | 6,209 | -------- | -------- | -------- | -------- | -------- | -------- |
| Crab meat, packaged, fresh-cooked ... pounds | 422,476 | 124,954 | 63,912 | $20,154 | 159,230 | $47,597 | 631,050 | 202,108 |
| Shrimp: | | | | | | | | |
| Cooked and peeled ... do | -------- | -------- | (1) | (1) | (1) | (1) | -------- | -------- |
| Canned ... standard cases | -------- | -------- | -------- | -------- | 142,485 | 725,757 | 32,206 | 200,676 |
| Marine-shell novelties | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 45,756 |
| Oysters: | | | | | | | | |
| Fresh-shucked ... gallons | 100,017 | 87,189 | 36,732 | 28,678 | 10,104 | 12,080 | 43,322 | 59,498 |
| Canned ... standard cases | (1) | (1) | 79,811 | 297,818 | (1) | (1) | (1) | (1) |
| Shell products: | | | | | | | | |
| Poultry feed ... tons | (1) | (1) | (1) | (1) | -------- | -------- | (1) | (1) |
| Lime ... do | 775 | 2,450 | (1) | (1) | -------- | -------- | -------- | -------- |
| Scallops, bay, fresh-shucked ... gallons | 2,665 | 4,664 | -------- | -------- | -------- | -------- | 11,303 | 20,454 |
| Unclassified products: | | | | | | | | |
| Packaged, fresh and frozen ... pounds | (2) | (2) | (2) | (2) | (2) | (2) | [3] 69,000 | [3] 22,730 |
| Salted and smoked ... do | [4] 49,460 | [4] 2,124 | -------- | -------- | -------- | -------- | [5] 10,500 | [5] 1,763 |
| Canned ... standard cases | (2) | (2) | (2) | (2) | (2) | (2) | [6] 27,768 | [6] 147,048 |
| Miscellaneous | -------- | [7] 58,665 | -------- | [8] 30,728 | -------- | [9] 80,564 | -------- | [10] 156,245 |
| Total | -------- | 1,493,200 | -------- | 377,378 | -------- | 865,998 | -------- | 1,444,771 |

See footnotes at end of table.

*Industries related to the fisheries of the South Atlantic and Gulf States, 1938*—Con.

PRODUCTS MANUFACTURED—Continued

| Item | North Carolina | | South Carolina | | Georgia | | Florida | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By fishermen: | | | | | | | | |
| Amberjack, smoked pounds | | | | | | | 680 | $170 |
| Alewives, corned do | 871,750 | $16,795 | | | | | | |
| Bluefish, smoked do | | | | | | | 200 | 16 |
| Grouper: | | | | | | | | |
| Smoked do | | | | | | | 1,100 | 215 |
| Fillets, salted do | | | | | | | 9,000 | 900 |
| King mackerel, smoked pounds | | | | | | | 2,750 | 730 |
| Mullet: | | | | | | | | |
| Smoked do | | | | | | | 41,600 | 8,105 |
| Salted do | 325,000 | 19,500 | 15,000 | $1,050 | | | 28,000 | 1,551 |
| Roe, salted do | | | | | | | 1,500 | 380 |
| Sailfish, smoked do | | | | | | | 12,040 | 2,206 |
| Shark products: | | | | | | | | |
| Hides do | 5,750 | 672 | | | | | 141,770 | 16,883 |
| Fins, dried do | 1,070 | 434 | | | | | 40,800 | 16,814 |
| Spanish mackerel, smoked pounds | | | | | | | 950 | 178 |
| Spot, salted do | 100,000 | 4,000 | 5,000 | 350 | | | | |
| Squeteague or "sea trout," smoked pounds | | | | | | | 1,150 | 257 |
| Sturgeon, caviar, salted pounds | | | 183 | 183 | 100 | $100 | | |
| Wahoo, salted do | | | | | | | 600 | 40 |
| Crab meat, packaged, fresh-cooked pounds | | | 85 | 26 | | | 4,170 | 1,310 |
| Shrimp, smoked do | | | | | | | 375 | 113 |
| Clams, hard, fresh-shucked gallons | 7,400 | 12,250 | 102 | 130 | | | 255 | 500 |
| Oysters, fresh-shucked do | 3,900 | 4,650 | 3,182 | 4,471 | 5,826 | 4,961 | 48,031 | 45,184 |
| Scallops, bay, fresh-shucked gallons | 610 | 976 | | | | | 4,961 | 4,072 |
| Total | | 59,277 | | 6,210 | | 5,061 | | 99,624 |
| Grand total | | 1,552,477 | | 383,588 | | 871,059 | | 1,544,395 |

| Item | Alabama | | Mississippi | | Louisiana | | Texas | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments: | | | | | | | | |
| Grouper, fresh steaks pounds | (1) | (1) | (1) | (1) | | | | |
| Mullet: | | | | | | | | |
| Salted do | 527,000 | $32,600 | | | | | | |
| Roe, salted do | 6,500 | 2,200 | | | | | | |
| Squeteague, or "sea trout," salted pounds | | | | | 13,300 | $1,995 | | |
| Crab meat, packaged, fresh-cooked pounds | 80,752 | 17,625 | 146,722 | $32,543 | 1,237,248 | 330,047 | 37,550 | $9,543 |
| Shrimp: | | | | | | | | |
| Cooked and peeled pounds | (1) | (1) | 287,117 | 71,536 | 583,903 | 166,665 | | |
| Frozen packaged do | | | | | 2,128,325 | 290,384 | 1,220,175 | 167,325 |
| Canned standard cases | (1) | (1) | 227,106 | 947,746 | 565,064 | 2,534,256 | (1) | (1) |
| Bran tons | | | | | 1,426 | 29,763 | | |
| Sun-dried pounds | | | | | 1,940,575 | 345,648 | | |
| Oysters: | | | | | | | | |
| Fresh-shucked gallons | 32,440 | 39,894 | 42,500 | 60,850 | 224,473 | 354,117 | 91,971 | 125,878 |
| Canned standard cases | (1) | (1) | 180,328 | 714,712 | 61,029 | 223,199 | | |
| Shell products: | | | | | | | | |
| Poultry feed tons | (1) | (1) | 17,584 | 64,335 | (1) | (1) | (1) | (1) |
| Lime do | (1) | (1) | 5,338 | 4,863 | (1) | (1) | (1) | (1) |
| Unclassified products: | | | | | | | | |
| Packaged, fresh and frozen pounds | (2) | (2) | (2) | (2) | | | | |
| Canned standard cases | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) |
| Miscellaneous | | [11] 276,111 | | [12] 1,890 | | [13] 338,865 | | [14] 396,846 |
| Total | | 368,430 | | 1,898,475 | | 4,614,939 | | 699,592 |

See footnotes at end of table.

### *Industries related to the fisheries of the South Atlantic and Gulf States, 1938*—Con.

PRODUCTS MANUFACTURED—Continued

| Item | Alabama |  | Mississippi |  | Louisiana |  | Texas |  |
|---|---|---|---|---|---|---|---|---|
|  | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By fishermen: |  |  |  |  |  |  |  |  |
| Mullet, salted.....pounds | 25,000 | $1,125 |  |  |  |  |  |  |
| Crab meat, packaged, fresh-cooked..........pounds | 10,500 | 2,300 | 20,698 | $4,140 |  |  | 36,440 | $8,168 |
| Oysters fresh-shucked gallons | 21,750 | 22,120 | 21,843 | 26,834 |  |  | 24,220 | 29,412 |
| Total |  | 25,545 |  | 30,974 |  |  |  | 37,580 |
| Grand total |  | 393,975 |  | 1,929,449 |  | $4,614,939 |  | 737,172 |

[1] This item has been shown under "Unclassified products."
[2] This item has been included under "Miscellaneous."
[3] Includes fresh fillets and steaks of red snapper, and fresh-cooked sea crawfish meat.
[4] Includes salted and dried alewives; and smoked alewives, mullet, and red drum.
[5] Includes smoked amberjack, mullet, and king mackerel; and salted crevalle.
[6] Includes canned oysters, hard-clam products, coquina-clam broth, and turtle products.
[7] Includes fresh fillets of croaker, red drum, Spanish mackerel, and squeteagues; frozen fillets of king whiting, Spanish mackerel and squeteagues; fresh sea-bass steaks; fresh-shucked hard clams; alewife oil, dry scrap and meal; canned oysters; and oyster-shell poultry feed.
[8] Includes canned hard crabs; cooked and peeled shrimp; and oyster-shell poultry feed and lime.
[9] Includes canned oysters and terrapin products; cooked and peeled shrimp; and menhaden acid scrap and oil.
[10] Includes shark dry scrap and liver oil; and oyster-shell poultry feed.
[11] Includes fresh and frozen steaks of grouper and red snapper; fresh fillets of Spanish mackerel and squeteagues; cooked and peeled shrimp; canned oysters and shrimp; and oyster-shell poultry feed and lime.
[12] Includes fresh steaks of grouper; fresh fillets of red snapper; canned crab and shrimp gumbo; and a small quantity of canned frog products which were produced in Florida.
[13] Includes canned soft crabs, crab and shrimp gumbo, turtle soup, fish bouillon, and crawfish bisque; and oyster-shell poultry feed and lime.
[14] Includes canned shrimp; and oyster-shell poultry feed and lime.

NOTE.—The total value of manufactured products in the South Atlantic and Gulf States was as follows: By manufacturing establishments, $11,762,783, and by fishermen, $264,271. Some of the above products may have been manufactured from products imported from another State or a foreign country; therefore, they cannot be correlated directly with the catch within the State. Of the total number of persons engaged in preparation of fishermen's manufactured products, 1,187 have also been included as fishermen and 340 of the persons shown on transporting craft have also been included as fishermen. This should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## NORTH CAROLINA

### *Fisheries of North Carolina, 1938*

OPERATING UNITS: BY GEAR

| Item | Purse seines, menhaden | Haul seines |  | Gill nets |  |  |  | Lines |
|---|---|---|---|---|---|---|---|---|
|  |  | Common | Long | Anchor | Drift | Run-around | Stake | Hand |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 531 | 42 | 145 | 163 | 12 | 43 |  | 23 |
| On boats and shore: |  |  |  |  |  |  |  |  |
| Regular |  | 1,773 | 387 | 584 | 168 | 677 | 295 | 58 |
| Casual |  | 251 | 12 | 46 | 36 | 55 | 43 |  |
| Total | 531 | 2,066 | 544 | 793 | 216 | 775 | 338 | 81 |
| Vessels, motor | 35 | 11 | 49 | 54 | 4 | 16 |  | 5 |
| Net tonnage | 1,182 | 102 | 327 | 326 | 30 | 102 |  | 44 |
| Boats: |  |  |  |  |  |  |  |  |
| Motor |  | 92 | 133 | 220 | 94 | 311 | 169 | 33 |
| Other |  | 383 | 133 | 96 | 8 | 360 | 70 |  |
| Accessory boats | 88 | 12 | 44 |  |  | 3 |  | 4 |
| Apparatus: |  |  |  |  |  |  |  |  |
| Number | 35 | 394 | 91 | 1,755 | 106 | 538 | 4,647 | 120 |
| Length, yards | 8,655 | 84,255 | 90,900 |  |  |  |  |  |
| Square yards |  |  |  | 909,477 | 140,100 | 377,945 | 306,020 |  |
| Hooks, baits, or snoods |  |  |  |  |  |  |  | 141 |

## *Fisheries of North Carolina, 1938*—Continued

### OPERATING UNITS: BY GEAR—Continued

| Item | Lines—Continued | | | Pound nets | Wheels | Fyke nets | Dip nets | Otter trawls, shrimp |
|---|---|---|---|---|---|---|---|---|
| | Troll | Trot with baits or snoods | Trot with hooks | | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | | | | | | | | 124 |
| On boats and shore: | | | | | | | | |
| Regular | 26 | 902 | 4 | 486 | | 23 | 284 | 244 |
| Casual | | 142 | 28 | 172 | 6 | 23 | 155 | 8 |
| Total | 26 | 1,044 | 32 | 658 | 6 | 46 | 439 | 376 |
| Vessels, motor | | | | | | | | 48 |
| Net tonnage | | | | | | | | 300 |
| Boats: | | | | | | | | |
| Motor | 18 | 112 | 10 | 272 | 1 | 21 | | 120 |
| Other | | 429 | 10 | 102 | 1 | 8 | 155 | 1 |
| Apparatus: | | | | | | | | |
| Number | 26 | 654 | 20 | 2,738 | 6 | 527 | 439 | 169 |
| Yards at mouth | | | | | | | | 2,902 |
| Hooks, baits, or snoods | 26 | 408,000 | 1,950 | | | | | |

| Item | Pots | | Spears | Dredges, oyster | Tongs, oyster | Rakes, other than for oysters | By hand, oyster | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| | Eel | Fish | | | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | | | | 172 | 4 | | | 1,091 |
| On boats and shore: | | | | | | | | |
| Regular | 62 | | 128 | 153 | 141 | 379 | 37 | 4,431 |
| Casual | 3 | 2 | 194 | 8 | 15 | 281 | 55 | 1,383 |
| Total | 65 | 2 | 322 | 333 | 160 | 660 | 92 | 6,905 |
| Vessels: | | | | | | | | |
| Motor | | | | 1 | 1 | | | 166 |
| Net tonnage | | | | 6 | 6 | | | 2,064 |
| Sail | | | | 64 | | | | 64 |
| Net tonnage | | | | 580 | | | | 580 |
| Total vessels | | | | 65 | 1 | | | 230 |
| Total net tonnage | | | | 586 | 6 | | | 2,644 |
| Boats: | | | | | | | | |
| Motor | 46 | | | 60 | 6 | | | 1,298 |
| Other | 8 | 2 | 287 | 32 | 150 | 313 | 45 | 1,802 |
| Accessory boats | | | | | 2 | | | 152 |
| Apparatus: | | | | | | | | |
| Number | 1,679 | 16 | 322 | 274 | 160 | 660 | | |
| Yards at mouth | | | | 260 | | | | |

### CATCH: BY GEAR

| Species | Purse seines | | Haul seines | | | |
|---|---|---|---|---|---|---|
| | | | Common | | Long | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 2,030,300 | $20,309 | | |
| Bluefish | | | 232,300 | 11,843 | 724,100 | $34,363 |
| Bonito | | | 10,000 | 196 | 200 | 4 |
| Bowfin | | | 1,200 | 12 | | |
| Butterfish | | | 6,800 | 204 | 1,100 | 33 |
| Cabio or crab eater | | | 100 | 5 | 100 | 3 |
| Carp | | | 41,800 | 688 | | |
| Catfish and bullheads | | | 112,300 | 3,302 | | |
| Crappie | | | | | 7,900 | 119 |
| Croaker | | | 418,900 | 6,035 | 2,629,200 | 35,864 |

*Fisheries of North Carolina, 1938*—Continued

CATCH: By gear—Continued

| Species | Purse seines | | Haul seines | | | |
|---|---|---|---|---|---|---|
| | | | Common | | Long | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Drum: | | | | | | |
| Black | | | 58,600 | $2,344 | 9,800 | $392 |
| Red or redfish | | | 413,700 | 15,781 | 100,800 | 1,923 |
| Eels, common | | | 800 | 32 | | |
| Flounders | | | 63,000 | 3,030 | 29,700 | 1,535 |
| Gizzard shad | | | 31,400 | 335 | | |
| Harvestfish or "starfish" | | | 78,800 | 2,414 | 15,400 | 462 |
| Hickory shad | | | 28,900 | 654 | 3,200 | 84 |
| Hogfish | | | 14,900 | 417 | 3,600 | 72 |
| King whiting or "kingfish" | | | 75,800 | 2,274 | 357,900 | 10,737 |
| Menhaden | 144,577,500 | $419,753 | 15,100 | 75 | 2,195,900 | 6,522 |
| Mullet | | | 1,547,700 | 60,891 | 22,600 | 759 |
| Pigfish | | | 15,600 | 309 | 200 | 3 |
| Pinfish or sailors choice | | | 400 | 7 | 200 | 4 |
| Pompano | | | 19,400 | 1,940 | 400 | 40 |
| Porgies | | | | | 900 | 18 |
| Sea bass | | | | | 200 | 10 |
| Shad | | | 46,500 | 7,440 | 500 | 80 |
| Sheepshead, salt-water | | | 18,100 | 402 | 1,700 | 38 |
| Spadefish | | | 2,100 | 84 | 4,100 | 100 |
| Spanish mackerel | | | 8,700 | 435 | 4,400 | 220 |
| Spot | | | 2,355,500 | 36,433 | 2,445,600 | 33,674 |
| Squeteague or "sea trout": | | | | | | |
| Gray | | | 181,900 | 7,143 | 1,553,300 | 54,388 |
| Spotted | | | 246,400 | 19,712 | 355,800 | 27,915 |
| Striped bass | | | 156,400 | 14,489 | 56,000 | 5,390 |
| Sturgeon | | | | | 300 | 3 |
| Tautog | | | 900 | 45 | | |
| White perch | | | 53,500 | 2,189 | | |
| Yellow perch | | | 3,800 | 152 | | |
| Crabs, soft and peelers | | | 27,300 | 4,087 | | |
| Turtles, snapper | | | 200 | 6 | | |
| Total | 144,577,500 | 419,753 | 8,319,100 | 225,714 | 10,525,100 | 214,755 |

| Species | Gill nets | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Anchor | | Drift | | Runaround | | Stake | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 91,300 | $913 | 45,000 | $450 | | | 21,800 | $227 |
| Bluefish | 23,100 | 2,058 | | | 632,100 | $35,798 | 198,900 | 10,521 |
| Bonito | 300 | 6 | | | | | | |
| Bowfin | 1,200 | 12 | | | | | 100 | 2 |
| Carp | 19,900 | 199 | 500 | 5 | | | 3,900 | 79 |
| Catfish and bullheads | 18,700 | 561 | | | | | 1,500 | 30 |
| Croaker | 1,266,200 | 17,189 | | | 21,400 | 294 | 309,600 | 4,643 |
| Drum: | | | | | | | | |
| Black | | | | | | | 200 | 8 |
| Red or redfish | | | | | 10,600 | 212 | 400 | 8 |
| Gizzard shad | 16,500 | 319 | | | | | 100 | 2 |
| Hickory shad | 16,700 | 338 | 1,000 | 20 | | | 25,100 | 492 |
| Hogfish | | | | | 200 | 8 | | |
| King whiting or "kingfish" | 401,600 | 12,048 | | | 576,100 | 17,283 | 2,700 | 81 |
| Mullet | 3,400 | 146 | | | 1,648,500 | 63,997 | 51,400 | 2,066 |
| Pigfish | | | | | 600 | 12 | | |
| Shad | 128,300 | 20,126 | 21,400 | 3,402 | | | 480,200 | 76,832 |
| Sharks | 581,400 | 1,744 | | | | | | |
| Spanish mackerel | | | | | 20,200 | 1,000 | | |
| Spot | 50,500 | 744 | | | 646,400 | 11,228 | 209,300 | 6,293 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 529,800 | 21,091 | | | 208,700 | 8,239 | 421,400 | 16,996 |
| Spotted | 20,500 | 1,640 | | | 149,900 | 11,832 | 29,400 | 2,352 |
| Striped bass | 73,400 | 6,051 | 1,100 | 104 | | | 10,200 | 956 |
| Sturgeon | | | | | | | 100 | 1 |
| Suckers | 100 | 1 | | | | | 100 | 1 |
| Tuna | 600 | 18 | | | | | | |
| White perch | 15,600 | 674 | 4,500 | 180 | 400 | 16 | 20,700 | 1,018 |
| Total | 3,259,100 | 85,878 | 73,500 | 4,161 | 3,915,100 | 149,919 | 1,787,100 | 122,608 |

## *Fisheries of North Carolina, 1938*—Continued

CATCH: BY GEAR—Continued

| Species | Lines | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Hand | | Troll | | Trot with baits or snoods | | Trot with hooks | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Catfish and bullheads | | | | | | | 32,000 | $920 |
| Sea bass | 66,200 | $3,310 | | | | | | |
| Snapper, red | 1,200 | 60 | | | | | | |
| Spanish mackerel | 35,000 | 1,750 | 148,500 | $7,425 | | | | |
| Crabs, hard | | | | | 3,829,700 | $72,455 | | |
| Total | 102,400 | 5,120 | 148,500 | 7,425 | 3,829,700 | 72,455 | 32,000 | 920 |

| Species | Pound nets | | Wheels | | Fyke nets | | Dip nets | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 8,958,100 | $89,586 | 10,000 | $100 | 52,600 | $526 | 10,000 | $100 |
| Bluefish | 38,500 | 1,925 | | | | | | |
| Bowfin | 100 | 1 | | | 2,400 | 27 | | |
| Butterfish | 7,200 | 216 | | | | | | |
| Carp | 52,200 | 544 | | | 105,400 | 1,385 | | |
| Catfish and bullheads | 376,100 | 11,260 | | | 162,300 | 4,869 | | |
| Croaker | 1,809,800 | 27,148 | | | | | | |
| Drum: | | | | | | | | |
| Black | 6,100 | 244 | | | | | | |
| Red or redfish | 4,600 | 76 | | | | | | |
| Eels, common | 7,000 | 330 | | | 1,400 | 56 | | |
| Flounders | 98,200 | 4,910 | | | | | | |
| Gizzard shad | 12,400 | 198 | | | 2,800 | 59 | | |
| Harvestfish or "starfish" | 334,500 | 10,065 | | | | | | |
| Hickory shad | 34,600 | 859 | | | 1,600 | 32 | | |
| Hogfish | 10,900 | 218 | | | | | | |
| King whiting or "kingfish" | 12,800 | 384 | | | | | | |
| Menhaden | 30,500 | 153 | | | | | | |
| Mullet | 2,500 | 100 | | | | | | |
| Pigfish | 5,000 | 100 | | | | | | |
| Pike or pickerel | 400 | 4 | | | 400 | 8 | | |
| Pompano | 500 | 50 | | | | | | |
| Shad | 354,900 | 56,691 | | | | | | |
| Sheepshead, salt-water | 500 | 10 | | | | | | |
| Spanish mackerel | 53,800 | 2,690 | | | | | | |
| Spot | 30,500 | 305 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 2,199,800 | 87,992 | | | | | | |
| Spotted | 46,000 | 3,680 | | | | | | |
| Striped bass | 205,900 | 19,777 | | | 19,700 | 1,861 | | |
| Suckers | 300 | 4 | | | 1,300 | 26 | | |
| White perch | 19,600 | 861 | 1,200 | 48 | 10,000 | 426 | | |
| Yellow perch | 900 | 38 | | | 4,400 | 145 | | |
| Crabs, soft and peelers | | | | | | | 97,100 | 14,565 |
| Shrimp | 15,000 | 450 | | | | | | |
| Total | 14,729,200 | 320,869 | 11,200 | 148 | 364,300 | 9,420 | 107,100 | 14,665 |

| Species | Otter trawls | | Pots | | | | Spears | |
|---|---|---|---|---|---|---|---|---|
| | | | Eel | | Fish | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Carp | | | | | 800 | $32 | | |
| Catfish and bullheads | | | | | 15,000 | 450 | | |
| Croaker | 20,000 | $200 | | | | | | |
| Eels, common | | | 102,700 | $3,388 | | | | |
| Flounders | 152,800 | 7,640 | | | | | 157,700 | $7,885 |
| King whiting or "kingfish" | 146,300 | 4,657 | | | | | | |
| White perch | | | | | 20,000 | 800 | | |
| Shrimp | 4,554,100 | 137,019 | | | | | | |
| Total | 4,873,200 | 149,516 | 102,700 | 3,388 | 35,800 | 1,282 | 157,700 | 7,885 |

## *Fisheries of North Carolina, 1938*—Continued

### CATCH: BY GEAR—Continued

| Species | Dredges | | Tongs | | Rakes | | By hand | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams: | | | | | | | | |
| Hard, public | | | | | 342, 500 | $26, 570 | | |
| Hard, private | | | | | 15, 400 | 1, 186 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 448, 600 | $26, 156 | 55, 300 | $3, 258 | | | 15, 300 | $925 |
| Public, fall | 742, 900 | 55, 932 | 120, 500 | 8, 921 | | | 31, 300 | 2, 416 |
| Private, spring | | | 9, 000 | 540 | | | | |
| Private, fall | | | 4, 000 | 320 | | | | |
| Scallops, bay | | | | | 29, 500 | 7, 971 | | |
| Total | 1, 191, 500 | 82, 088 | 188, 800 | 13, 039 | 387, 400 | 35, 727 | 46, 600 | 3, 341 |

### OPERATING UNITS: BY COUNTIES

| Item | Beaufort | Bertie | Brunswick | Camden | Carteret | Chowan | Craven |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 117 | | 73 | | 762 | | |
| On boats and shore: | | | | | | | |
| Regular | 198 | 60 | 403 | | 1, 428 | | 32 |
| Casual | 80 | | 178 | 15 | 420 | 121 | 18 |
| Total | 395 | 60 | 654 | 15 | 2, 610 | 121 | 50 |
| Vessels: | | | | | | | |
| Motor | 3 | | 23 | | 107 | | |
| Net tonnage | 53 | | 206 | | 1, 600 | | |
| Sail | 43 | | | | 7 | | |
| Net tonnage | 392 | | | | 78 | | |
| Total vessels | 46 | | 23 | | 114 | | |
| Total net tonnage | 445 | | 206 | | 1, 678 | | |
| Boats: | | | | | | | |
| Motor | 71 | 19 | 55 | 13 | 274 | 40 | 13 |
| Other | 82 | 2 | 174 | | 681 | 20 | 15 |
| Accessory boats | | | 2 | | 130 | | |
| Apparatus: | | | | | | | |
| Purse seines, menhaden | | | 1 | | 34 | | |
| Length, yards | | | 240 | | 8, 415 | | |
| Haul seines: | | | | | | | |
| Common | 12 | 2 | 22 | | 160 | 1 | 3 |
| Length, yards | 2, 300 | 2, 000 | 4, 400 | | 12, 105 | 350 | 3, 600 |
| Long | 3 | | | | 47 | | |
| Length, yards | 3, 000 | | | | 47, 000 | | |
| Gill nets: | | | | | | | |
| Anchor | | | 25 | 40 | 124 | 105 | |
| Square yards | | | 7, 000 | 4, 000 | 255, 517 | 36, 750 | |
| Drift | | | 9 | | 3 | | |
| Square yards | | | 3, 600 | | 6, 900 | | |
| Runaround | 41 | | 99 | | 88 | | 10 |
| Square yards | 16, 300 | | 24, 080 | | 159, 070 | | 9, 500 |
| Stake | 280 | | | 65 | 1, 110 | | 300 |
| Square yards | 15, 120 | | | 5, 200 | 63, 600 | | 15, 000 |
| Lines: | | | | | | | |
| Hand | | | | | 38 | | |
| Hooks | | | | | 55 | | |
| Troll | | | | | 26 | | |
| Hooks | | | | | 26 | | |
| Trot with baits or snoods | 138 | | 46 | | 174 | | |
| Baits or snoods | 69, 000 | | 20, 000 | | 174, 000 | | |
| Pound nets | 83 | 359 | | | 100 | 439 | 26 |
| Fyke nets | | | | 24 | | | |
| Dip nets | | | | | 414 | | |
| Otter trawls, shrimp | 3 | | 47 | | 103 | | |
| Yards at mouth | 48 | | 983 | | 1, 608 | | |
| Pots, eel | 162 | | | | | | |
| Spears | | | 95 | | 42 | | |
| Dredges, oyster | 106 | | | | 17 | | |
| Yards at mouth | 118 | | | | 17 | | |
| Tongs, oyster | | | | | 84 | | |
| Rakes, other than for oysters | | | 8 | | 642 | | |

## *Fisheries of North Carolina, 1938*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Currituck | Dare | Gates | Hertford | Hyde | Martin | New Hanover | Onslow |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | -------- | 46 | -------- | -------- | 9 | -------- | -------- | 14 |
| On boats and shore: | | | | | | | | |
| Regular | 186 | 764 | -------- | -------- | 167 | -------- | 320 | 268 |
| Casual | 9 | 57 | 16 | 36 | -------- | 88 | 140 | 58 |
| Total | 195 | 867 | 16 | 36 | 176 | 88 | 460 | 340 |
| Vessels: | | | | | | | | |
| Motor | -------- | 16 | -------- | -------- | 1 | -------- | -------- | 4 |
| Net tonnage | -------- | 96 | -------- | -------- | 5 | -------- | -------- | 28 |
| Sail | -------- | -------- | -------- | -------- | 2 | -------- | -------- | -------- |
| Net tonnage | -------- | -------- | -------- | -------- | 14 | -------- | -------- | -------- |
| Total vessels | -------- | 16 | -------- | -------- | 3 | -------- | -------- | 4 |
| Total net tonnage | -------- | 96 | -------- | -------- | 19 | -------- | -------- | 28 |
| Boats: | | | | | | | | |
| Motor | 74 | 279 | 3 | 4 | 59 | 19 | 82 | 48 |
| Other | 61 | 218 | 4 | 1 | 50 | 20 | 123 | 157 |
| Accessory boats | -------- | 6 | -------- | -------- | -------- | -------- | -------- | 2 |
| Apparatus: | | | | | | | | |
| Haul seines: | | | | | | | | |
| Common | 48 | 54 | 2 | 1 | 5 | 2 | 22 | 27 |
| Length, yards | 16, 000 | 25, 500 | 1, 200 | 950 | 1, 450 | 1, 200 | 2, 200 | 4, 100 |
| Long | -------- | 19 | -------- | -------- | -------- | -------- | -------- | -------- |
| Length, yards | -------- | 19, 000 | -------- | -------- | -------- | -------- | -------- | -------- |
| Gill nets: | | | | | | | | |
| Anchor | 157 | 486 | 2 | -------- | 4 | -------- | -------- | 15 |
| Square yards | 25, 220 | 197, 120 | 400 | -------- | 8, 600 | -------- | -------- | 29, 200 |
| Drift | -------- | 1 | 2 | -------- | -------- | 7 | 78 | -------- |
| Square yards | -------- | 3, 300 | 400 | -------- | -------- | 7, 000 | 109, 200 | -------- |
| Runaround | -------- | 45 | -------- | -------- | 18 | -------- | 95 | 93 |
| Square yards | -------- | 95, 900 | -------- | -------- | 15, 200 | -------- | 21, 375 | 880 |
| Stake | 60 | 1, 890 | -------- | -------- | 330 | -------- | 60 | -------- |
| Square yards | 4, 800 | 111, 700 | -------- | -------- | 32, 000 | -------- | 4, 800 | -------- |
| Lines: | | | | | | | | |
| Hand | -------- | -------- | -------- | -------- | -------- | -------- | 16 | 62 |
| Hooks | -------- | -------- | -------- | -------- | -------- | -------- | 16 | 62 |
| Trot with baits or snoods | 5 | 8 | -------- | -------- | 33 | -------- | 60 | 100 |
| Baits or snoods | 2, 500 | 8, 000 | -------- | -------- | 16, 500 | -------- | 30, 000 | 40, 000 |
| Trot with hooks | -------- | -------- | -------- | -------- | -------- | 18 | 2 | -------- |
| Hooks | -------- | -------- | -------- | -------- | -------- | 950 | 1, 000 | -------- |
| Pound nets | 10 | 1, 225 | 14 | 48 | 92 | -------- | -------- | -------- |
| Wheels | -------- | -------- | -------- | -------- | -------- | 6 | -------- | -------- |
| Fyke nets | 257 | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Dip nets | 5 | -------- | -------- | -------- | -------- | 20 | -------- | -------- |
| Otter trawls, shrimp | -------- | 2 | -------- | -------- | -------- | -------- | -------- | 1 |
| Yards at mouth | -------- | 35 | -------- | -------- | -------- | -------- | -------- | 15 |
| Pots: | | | | | | | | |
| Eel | 1, 370 | 80 | -------- | -------- | -------- | -------- | -------- | -------- |
| Fish | -------- | -------- | -------- | -------- | -------- | 16 | -------- | -------- |
| Spears | -------- | 50 | -------- | -------- | 5 | -------- | 75 | 25 |
| Dredges, oyster | -------- | -------- | -------- | -------- | 24 | -------- | -------- | -------- |
| Yards at mouth | -------- | -------- | -------- | -------- | 26 | -------- | -------- | -------- |
| Tongs, oyster | -------- | -------- | -------- | -------- | 5 | -------- | -------- | 35 |
| Rakes, other than for oysters | -------- | -------- | -------- | -------- | -------- | -------- | 10 | -------- |

| Item | Pamlico | Pasquotank | Pender | Perquimans | Tyrrell | Washington |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 70 | -------- | -------- | -------- | -------- | -------- |
| On boats and shore: | | | | | | |
| Regular | 245 | 32 | 149 | 78 | 17 | 84 |
| Casual | -------- | 27 | 18 | 7 | 95 | -------- |
| Total | 315 | 59 | 167 | 85 | 112 | 84 |
| Vessels: | | | | | | |
| Motor | 12 | -------- | -------- | -------- | -------- | -------- |
| Net tonnage | 76 | -------- | -------- | -------- | -------- | -------- |
| Sail | 12 | -------- | -------- | -------- | -------- | -------- |
| Net tonnage | 96 | -------- | -------- | -------- | -------- | -------- |
| Total vessels | 24 | -------- | -------- | -------- | -------- | -------- |
| Total net tonnage | 172 | -------- | -------- | -------- | -------- | -------- |

### *Fisheries of North Carolina, 1938*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Pamlico | Pasquotank | Pender | Perquimins | Tyrrell | Washington |
|---|---|---|---|---|---|---|
| Boats: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Motor | 112 | 25 | 4 | 34 | 43 | 27 |
| Other | 64 | 5 | 49 | 28 | 33 | 15 |
| Accessory boats | 12 | | | | | |
| Apparatus: | | | | | | |
| Haul seines: | | | | | | |
| Common | 4 | 5 | 20 | 2 | | 2 |
| Length, yards | 800 | 1,100 | 3,200 | 200 | | 1,600 |
| Long | 22 | | | | | |
| Length, yards | 21,900 | | | | | |
| Gill nets: | | | | | | |
| Anchor | | 163 | | 384 | 100 | 150 |
| Square yards | | 47,270 | | 172,000 | 60,000 | 66,400 |
| Drift | | | | | 3 | 3 |
| Square yards | | | | | 4,500 | 5,200 |
| Runaround | 23 | 2 | 24 | | | |
| Square yards | 27,600 | 4,200 | 3,840 | | | |
| Stake | 280 | 30 | | 12 | 230 | |
| Square yards | 22,400 | 2,600 | | 1,200 | 27,600 | |
| Lines: | | | | | | |
| Hand | | | 4 | | | |
| Hooks | | | 8 | | | |
| Trot with baits or snoods | 80 | | 10 | | | |
| Baits or snoods | 43,000 | | 5,000 | | | |
| Pound nets | 78 | 12 | | 108 | 72 | 72 |
| Fyke nets | | 40 | | 56 | 150 | |
| Otter trawls, shrimp | 13 | | | | | |
| Yards at mouth | 213 | | | | | |
| Pots, eel | | 12 | | 25 | 10 | 20 |
| Spears | | | 30 | | | |
| Dredges, oyster | 127 | | | | | |
| Yards at mouth | 99 | | | | | |
| Tongs, oyster | 16 | | | | | |

CATCH: BY COUNTIES

| Species | Beaufort | | Bertie | | Brunswick | | Camden | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 1,000 | $10 | 6,030,000 | $60,300 | | | 10,000 | $100 |
| Bluefish | 14,200 | 710 | | | 80,000 | $4,010 | | |
| Bowfin | | | | | | | 400 | 8 |
| Cabio or crab eater | 100 | 3 | | | | | | |
| Carp | 3,100 | 93 | | | | | 4,400 | 44 |
| Catfish and bullheads | 13,200 | 366 | 17,500 | 525 | | | 5,000 | 150 |
| Croaker | 140,000 | 2,000 | | | 35,000 | 350 | | |
| Drum: | | | | | | | | |
| Black | 100 | 4 | | | | | | |
| Red or redfish | 5,400 | 134 | | | 7,500 | 175 | | |
| Eels, common | 14,600 | 730 | | | | | | |
| Flounders | 8,300 | 415 | | | 38,200 | 1,910 | | |
| Gizzard shad | | | | | | | 300 | 9 |
| Harvestfish or "starfish" | 50,000 | 1,500 | | | | | | |
| Hickory shad | 300 | 6 | | | | | 800 | 16 |
| Hogfish | 2,400 | 48 | | | | | | |
| King whiting or "kingfish" | | | | | 25,300 | 759 | | |
| Menhaden | | | | | 7,266,000 | 21,580 | | |
| Mullet | 74,900 | 2,996 | | | 820,000 | 32,800 | 2,000 | 100 |
| Porgies | 400 | 8 | | | | | | |
| Sea bass | 200 | 10 | | | | | | |
| Shad | 1,800 | 288 | 5,200 | 832 | 6,200 | 980 | 2,700 | 432 |
| Sheepshead, salt-water | 1,100 | 24 | | | | | | |
| Spadefish | 3,500 | 82 | | | | | | |
| Spanish mackerel | 8,500 | 425 | | | | | | |
| Spot | 10,000 | 100 | | | 447,500 | 8,950 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 233,000 | 9,320 | | | | | | |
| Spotted | 18,000 | 1,440 | | | 3,800 | 304 | | |
| Striped bass | 12,300 | 1,206 | 10,600 | 954 | | | 4,700 | 470 |
| Suckers | | | | | | | 200 | 2 |
| White perch | 1,500 | 60 | 8,100 | 384 | | | 400 | 12 |
| Yellow perch | 900 | 36 | | | | | 100 | 3 |
| Crabs, hard | 1,159,800 | 23,196 | | | 145,000 | 2,700 | | |
| Shrimp | 165,900 | 4,977 | | | 1,977,100 | 59,709 | | |
| Clams, hard, public | | | | | 2,000 | 240 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 176,800 | 10,608 | | | | | | |
| Public, fall | 407,900 | 32,632 | | | 5,500 | 367 | | |
| Total | 2,529,200 | 93,427 | 6,071,400 | 62,995 | 10,859,100 | 134,834 | 31,000 | 1,346 |

## *Fisheries of North Carolina, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Carteret | | Chowan | | Craven | | Currituck | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 700 | $7 | 3,492,500 | $34,925 | 2,800 | $42 | 5,000 | $56 |
| Bluefish | 1,255,300 | 66,988 | | | | | | |
| Bonito | 6,900 | 134 | | | | | | |
| Bowfin | | | | | | | 1,000 | 10 |
| Butterfish | 7,200 | 216 | | | | | | |
| Cabio or crab eater | 100 | 5 | | | | | | |
| Carp | 700 | 35 | 3,000 | 30 | 1,900 | 19 | 84,800 | 1,406 |
| Catfish and bullheads | | | 50,000 | 1,500 | 1,500 | 30 | 31,900 | 957 |
| Crappie | 7,900 | 119 | | | | | | |
| Croaker | 1,488,700 | 20,676 | | | 144,500 | 2,168 | 3,000 | 47 |
| Drum: | | | | | | | | |
| Black | 58,600 | 2,344 | | | | | | |
| Red or redfish | 391,100 | 15,644 | | | | | | |
| Eels, common | | | | | | | 80,000 | 2,275 |
| Flounders | 243,700 | 12,065 | | | | | 2,300 | 115 |
| Gizzard shad | | | | | | | 27,100 | 271 |
| Harvestfish or "starfish" | 31,200 | 936 | | | | | | |
| Hickory shad | 10,700 | 214 | | | 5,400 | 108 | 300 | 10 |
| King whiting or "kingfish" | 1,359,600 | 41,056 | | | | | 12,500 | 375 |
| Menhaden | 139,507,400 | 404,695 | | | | | | |
| Mullet | 1,120,700 | 41,801 | | | 35,000 | 1,400 | | |
| Pigfish | 6,600 | 128 | | | | | | |
| Pinfish or "sailors choice" | 200 | 3 | | | | | | |
| Pompano | 13,200 | 1,320 | | | | | | |
| Sea bass | 7,800 | 390 | | | | | | |
| Shad | 9,300 | 1,395 | 21,000 | 3,360 | | | 25,700 | 4,112 |
| Sharks | 581,400 | 1,744 | | | | | | |
| Sheepshead, salt-water | 6,400 | 160 | | | | | | |
| Snapper, red | 1,200 | 60 | | | | | | |
| Spanish mackerel | 183,500 | 9,175 | | | | | | |
| Spot | 2,693,200 | 44,528 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 1,232,500 | 49,443 | | | | | | |
| Spotted | 233,400 | 18,512 | | | 16,700 | 1,336 | | |
| Striped bass | 800 | 40 | 8,600 | 774 | 700 | 70 | 96,600 | 9,660 |
| Tuna | 600 | 18 | | | | | | |
| White perch | 400 | 20 | 2,500 | 110 | | | 40,000 | 1,610 |
| Yellow perch | | | | | | | 4,500 | 180 |
| Crabs: | | | | | | | | |
| Hard | 787,000 | 11,806 | | | | | 85,000 | 1,270 |
| Soft and peelers | 114,400 | 17,152 | | | | | 10,000 | 1,500 |
| Shrimp | 2,193,900 | 65,817 | | | | | | |
| Clams: | | | | | | | | |
| Hard, public | 336,500 | 26,010 | | | | | | |
| Hard, private | 15,400 | 1,186 | | | | | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 43,400 | 1,791 | | | | | | |
| Public, fall | 138,800 | 6,836 | | | | | | |
| Scallops, bay | 29,500 | 7,971 | | | | | | |
| Total | 154,119,900 | 872,440 | 3,577,600 | 40,699 | 208,500 | 5,173 | 509,700 | 23,854 |

| Species | Dare | | Gates | | Hertford | | Hyde | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 15,900 | $159 | 225,000 | $2,250 | 900,000 | $9,000 | | |
| Bluefish | 231,700 | 11,410 | | | | | 52,000 | $2,600 |
| Bonito | 3,600 | 72 | | | | | | |
| Bowfin | 400 | 4 | | | | | | |
| Butterfish | 3,900 | 117 | | | | | | |
| Carp | 27,600 | 276 | | | | | | |
| Catfish and bullheads | 19,200 | 576 | | | 7,500 | 225 | | |
| Croaker | 2,251,400 | 33,765 | | | | | 507,200 | 7,616 |
| Drum: | | | | | | | | |
| Black | 15,800 | 632 | | | | | | |
| Red or redfish | 16,700 | 240 | | | | | 4,500 | 51 |
| Eels, common | 9,000 | 413 | | | | | | |
| Flounders | 109,600 | 5,530 | | | | | 5,500 | 275 |
| Gizzard shad | 8,300 | 83 | | | | | | |
| Harvestfish or "starfish" | 164,500 | 4,935 | | | | | 87,000 | 2,690 |
| Hickory shad | 51,300 | 1,399 | | | | | | |
| Hogfish | 27,000 | 659 | | | | | | |
| King whiting or "kingfish" | 94,300 | 2,829 | | | | | | |

## *Fisheries of North Carolina, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Dare | | Gates | | Hertford | | Hyde | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Menhaden | 45,600 | $228 | | | | | | |
| Mullet | 117,500 | 4,698 | | | | | 5,500 | $165 |
| Pigfish | 4,000 | 80 | | | | | | |
| Pinfish or sailors choice | 400 | 8 | | | | | | |
| Pompano | 1,800 | 180 | | | | | | |
| Porgies | 500 | 10 | | | | | | |
| Shad | 719,900 | 115,184 | 3,600 | $576 | 5,500 | $880 | 1,000 | 160 |
| Sheepshead, salt-water | 4,200 | 94 | | | | | | |
| Spadefish | 2,700 | 102 | | | | | | |
| Spanish mackerel | 44,300 | 2,215 | | | | | 24,200 | 1,200 |
| Spot | 422,900 | 4,701 | | | | | 75,000 | 750 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 1,950,100 | 78,004 | | | | | 480,100 | 19,204 |
| Spotted | 285,600 | 22,848 | | | | | 12,500 | 1,000 |
| Striped bass | 278,400 | 26,568 | 2,200 | 198 | 3,000 | 270 | 900 | 90 |
| Sturgeon | 400 | 4 | | | | | | |
| Suckers | 200 | 2 | | | | | | |
| Tautog | 900 | 45 | | | | | | |
| White perch | 21,700 | 868 | 1,200 | 54 | | | | |
| Yellow perch | 100 | 4 | | | 500 | 22 | | |
| Crabs, hard | 42,500 | 1,275 | | | | | 317,000 | 6,340 |
| Shrimp | 30,700 | 921 | | | | | 5,000 | 150 |
| Oysters, market: | | | | | | | | |
| Public, spring | | | | | | | 34,400 | 2,064 |
| Public, fall | | | | | | | 55,800 | 4,464 |
| Turtles, snapper | 200 | 6 | | | | | | |
| Total | 7,024,800 | 321,144 | 232,000 | 3,078 | 916,500 | 10,397 | 1,667,600 | 48,819 |

| Species | Martin | | New Hanover | | Onslow | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 225,000 | $2,250 | | | | |
| Bluefish | | | 13,100 | $655 | 5,000 | $250 |
| Carp | 1,300 | 52 | | | | |
| Catfish and bullheads | 43,000 | 1,290 | 4,000 | 80 | | |
| Croaker | | | 10,000 | 100 | 33,900 | 339 |
| Drum, red or redfish | | | 5,100 | 102 | 3,000 | 60 |
| Flounders | | | 13,800 | 690 | 9,500 | 475 |
| King whiting or "kingfish" | | | | | 75,000 | 2,250 |
| Mullet | | | 467,800 | 18,712 | 224,000 | 8,939 |
| Sea bass | | | 8,400 | 420 | 40,000 | 2,000 |
| Shad | 1,000 | 150 | 18,000 | 2,880 | | |
| Spot | | | 705,100 | 14,102 | 365,500 | 5,360 |
| Squeteagues or "sea trout": | | | | | | |
| Gray | | | | | 28,000 | 840 |
| Spotted | | | 700 | 56 | 81,200 | 6,496 |
| Striped bass | 800 | 64 | 500 | 50 | | |
| White perch | 26,100 | 1,048 | | | | |
| Crabs, hard | | | 372,500 | 7,450 | 220,000 | 4,400 |
| Shrimp | | | | | 7,500 | 225 |
| Clams, hard, public | | | 4,000 | 320 | | |
| Oysters, market: | | | | | | |
| Public, spring | | | 9,900 | 594 | 45,300 | 2,718 |
| Public, fall | | | 19,300 | 1,544 | 68,400 | 5,472 |
| Private, spring | | | | | 9,000 | 540 |
| Private, fall | | | | | 4,000 | 320 |
| Total | 297,200 | 4,854 | 1,652,200 | 47,755 | 1,219,300 | 40,684 |

## *Fisheries of North Carolina, 1938*—Continued

### CATCH: BY COUNTIES—Continued

| Species | Pamlico | | Pasquotank | | Pender | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 2,500 | $25 | 700 | $7 | | |
| Bluefish | 181,200 | 9,060 | | | 16,500 | $825 |
| Bowfin | | | 2,100 | 21 | | |
| Butterfish | 4,000 | 120 | | | | |
| Carp | | | 16,800 | 168 | | |
| Catfish and bullheads | 6,000 | 120 | 226,300 | 6,789 | | |
| Croaker | 1,861,400 | 24,312 | | | | |
| Drum: | | | | | | |
| Black | | | 200 | 8 | | |
| Red or redfish | 83,900 | 1,336 | 400 | 8 | 12,500 | 250 |
| Eels, common | 5,000 | 250 | 1,700 | 68 | | |
| Flounders | 43,200 | 2,160 | 1,000 | 50 | 25,500 | 1,275 |
| Gizzard shad | | | 17,100 | 342 | | |
| Harvestfish or "starfish" | 96,000 | 2,880 | | | | |
| Hickory shad | 12,000 | 120 | 10,900 | 218 | 2,500 | 50 |
| Hogfish | | | 200 | 8 | | |
| King whiting or "kingfish" | 3,800 | 114 | 2,700 | 81 | | |
| Mullet | 50,700 | 2,028 | 1,900 | 76 | 353,900 | 14,156 |
| Pigfish | | | 7,800 | 156 | | |
| Pike or pickerel | | | 400 | 8 | | |
| Pompano | 5,300 | 530 | | | | |
| Sea bass | | | | | 10,000 | 500 |
| Shad | 23,000 | 3,680 | 84,100 | 13,054 | | |
| Sheepshead, salt-water | 8,600 | 172 | | | | |
| Spanish mackerel | 10,100 | 505 | | | | |
| Spot | 555,500 | 5,555 | 16,300 | 163 | 446,800 | 4,468 |
| Squeteagues or "sea trout": | | | | | | |
| Gray | 1,164,600 | 38,840 | 6,600 | 198 | | |
| Spotted | 176,800 | 13,595 | 2,800 | 224 | 16,400 | 1,312 |
| Striped bass | 3,500 | 350 | 30,500 | 2,440 | | |
| Suckers | | | 1,300 | 26 | | |
| White perch | | | 1,900 | 76 | | |
| Crabs, hard | 650,900 | 13,018 | | | 50,000 | 1,000 |
| Shrimp | 189,000 | 5,670 | | | | |
| Oysters, market: | | | | | | |
| Public, spring | 204,400 | 12,264 | | | 5,000 | 300 |
| Public, fall | 196,000 | 15,714 | | | 3,000 | 240 |
| Total | 5,537,400 | 152,418 | 433,700 | 24,189 | 942,100 | 24,376 |

| Species | Perquimans | | Tyrrell | | Washington | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 700 | $7 | 130,400 | $1,304 | 176,900 | $1,769 |
| Bowfin | 1,000 | 10 | 100 | 1 | | |
| Carp | 15,400 | 154 | 52,500 | 525 | 13,000 | 130 |
| Catfish and bullheads | 169,500 | 5,085 | 76,900 | 2,307 | 46,400 | 1,392 |
| Eels, common | 1,300 | 52 | 100 | 6 | 200 | 12 |
| Flounders | 600 | 30 | 200 | 10 | | |
| Gizzard shad | 10,200 | 204 | 200 | 4 | | |
| Hickory shad | 8,700 | 174 | 200 | 4 | 8,000 | 160 |
| Mullet | 2,000 | 80 | 200 | 8 | | |
| Pigfish | | | 3,000 | 60 | | |
| Pike or pickerel | 300 | 3 | 100 | 1 | | |
| Shad | 85,100 | 13,616 | 12,200 | 1,952 | 6,500 | 1,040 |
| Squeteagues or "sea trout," spotted | | | 100 | 8 | | |
| Striped bass | 29,000 | 2,320 | 22,000 | 1,925 | 17,600 | 1,179 |
| Suckers | | | 100 | 2 | | |
| White perch | 7,000 | 300 | 22,200 | 1,110 | 12,500 | 560 |
| Yellow perch | | | 3,000 | 90 | | |
| Total | 330,800 | 22,035 | 323,500 | 9,317 | 281,100 | 6,242 |

## SOUTH CAROLINA

### *Fisheries of South Carolina, 1938*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Gill nets | | | | Lines | | | Dip nets |
|---|---|---|---|---|---|---|---|---|---|
| | | Anchor | Drift | Run-around | Stake | Hand | Troll | Trot with baits or snoods | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | -------- | -------- | -------- | -------- | -------- | 22 | 6 | -------- | -------- |
| On boats and shore: | | | | | | | | | |
| Regular | 82 | -------- | -------- | 58 | -------- | 34 | -------- | 115 | -------- |
| Casual | 90 | 128 | 70 | 30 | 31 | 20 | -------- | 64 | 12 |
| Total | 172 | 128 | 70 | 88 | 31 | 76 | 6 | 179 | 12 |
| Vessels: | | | | | | | | | |
| Motor | -------- | -------- | -------- | -------- | -------- | 3 | 1 | -------- | -------- |
| Net tonnage | -------- | -------- | -------- | -------- | -------- | 29 | 11 | -------- | -------- |
| Sail | -------- | -------- | -------- | -------- | -------- | 1 | -------- | -------- | -------- |
| Net tonnage | -------- | -------- | -------- | -------- | -------- | 12 | -------- | -------- | -------- |
| Total vessels | -------- | -------- | -------- | -------- | -------- | 4 | 1 | -------- | -------- |
| Total net tonnage | -------- | -------- | -------- | -------- | -------- | 41 | 11 | -------- | -------- |
| Boats: | | | | | | | | | |
| Motor | -------- | 2 | -------- | 14 | -------- | 13 | -------- | -------- | -------- |
| Other | 42 | 84 | 35 | 49 | 16 | 12 | -------- | 93 | 6 |
| Accessory boats | -------- | -------- | -------- | -------- | -------- | 10 | -------- | -------- | -------- |
| Apparatus: | | | | | | | | | |
| Number | 38 | 106 | 35 | 49 | 16 | 98 | 8 | 125 | 6 |
| Length, yards | 6,185 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Square yards | -------- | 67,880 | 49,710 | 22,770 | 10,925 | -------- | -------- | -------- | -------- |
| Hooks, baits, or snoods | -------- | -------- | -------- | -------- | -------- | 130 | 8 | 35,848 | -------- |

| Item | Cast nets | Otter trawls, shrimp | Pots, fish | Spears | Dredges, oyster | Grabs | By hand | | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Oyster | Other | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | -------- | 56 | -------- | -------- | 3 | -------- | -------- | -------- | 75 |
| On boats and shore: | | | | | | | | | |
| Regular | -------- | 40 | -------- | 52 | -------- | 146 | 179 | 47 | 654 |
| Casual | 26 | -------- | 20 | 45 | -------- | 30 | 70 | 65 | 701 |
| Total | 26 | 96 | 20 | 97 | 3 | 176 | 249 | 112 | 1,430 |
| Vessels: | | | | | | | | | |
| Motor | -------- | 20 | -------- | -------- | 1 | -------- | -------- | -------- | 23 |
| Net tonnage | -------- | 165 | -------- | -------- | 6 | -------- | -------- | -------- | 191 |
| Sail | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 1 |
| Net tonnage | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 12 |
| Total vessels | -------- | 20 | -------- | -------- | 1 | -------- | -------- | -------- | 24 |
| Total net tonnage | -------- | 165 | -------- | -------- | 6 | -------- | -------- | -------- | 203 |
| Boats: | | | | | | | | | |
| Motor | -------- | 20 | -------- | -------- | -------- | -------- | -------- | -------- | 48 |
| Other | 19 | -------- | 10 | 82 | -------- | 146 | 105 | 24 | 591 |
| Accessory boats | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 10 |
| Apparatus: | | | | | | | | | |
| Number | 26 | 40 | 105 | 97 | 1 | 176 | -------- | -------- | -------- |
| Yards at mouth | -------- | 814 | -------- | -------- | 2 | -------- | -------- | -------- | -------- |

## *Fisheries of South Carolina, 1938*—Continued

### CATCH: BY GEAR

| Species | Haul seines | | Gill nets | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Anchor | | Drift | | Runaround | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 1,500 | $90 | | | | | 6,000 | $315 |
| Catfish and bullheads | 1,000 | 30 | | | | | | |
| Croaker | 1,000 | 30 | | | | | | |
| Drum: | | | | | | | | |
| Black | 22,500 | 825 | | | | | 5,500 | 235 |
| Red or redfish | 57,500 | 2,935 | | | | | 43,000 | 2,735 |
| Flounders | 14,000 | 1,100 | | | | | 2,500 | 175 |
| Hickory shad | | | 2,900 | $51 | 1,400 | $28 | | |
| King whiting or "kingfish" | 55,000 | 1,600 | | | | | | |
| Mullet | 413,000 | 15,855 | | | | | 174,000 | 6,930 |
| Shad | | | 16,300 | 3,260 | 24,500 | 5,058 | | |
| Sheepshead, salt-water | 400 | 15 | | | | | 2,500 | 50 |
| Spot | 159,300 | 3,586 | | | | | 36,500 | 1,050 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 2,500 | 175 | | | | | 2,500 | 175 |
| Spotted | 46,300 | 4,419 | | | | | 22,500 | 2,040 |
| Sturgeon | | | 16,400 | 1,476 | 9,300 | 1,027 | | |
| Total | 774,000 | 30,660 | 35,600 | 4,787 | 35,200 | 6,113 | 295,000 | 13,705 |

| Species | Gill nets—Con. | | Lines | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Stake | | Hand | | Troll | | Trot, with baits or snoods | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | | | 28,100 | $2,248 | 7,000 | $560 | | |
| Bonito | | | 300 | 9 | | | | |
| Croaker | | | 100 | 3 | | | | |
| Drum, red or redfish | | | 3,000 | 150 | | | | |
| Grunts | | | 2,500 | 75 | | | | |
| Hickory shad | 4,200 | $121 | | | | | | |
| King whiting or "kingfish" | | | 25,000 | 1,250 | | | | |
| Porgies | | | 1,000 | 13 | | | | |
| Sea bass | | | 111,500 | 6,265 | | | | |
| Sea catfish | | | 100,000 | 3,000 | | | | |
| Shad | 18,000 | 3,590 | | | | | | |
| Squeteagues or "sea trout," spotted | | | 10,000 | 900 | | | | |
| Striped bass | 600 | 108 | | | | | | |
| Crabs, hard | | | | | | | 714,800 | $13,213 |
| Total | 22,800 | 3,819 | 281,500 | 13,913 | 7,000 | 560 | 714,800 | 13,213 |

| Species | Dip nets | | Cast nets | | Otter trawls | | Pots, fish | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Catfish and bullheads | | | | | | | 72,000 | $2,460 |
| Flounders | | | | | | | 2,500 | 175 |
| King whiting or "kingfish" | | | | | 6,000 | $120 | | |
| Shad | 600 | $102 | | | | | | |
| Shrimp | | | 70,900 | $2,127 | 3,651,900 | 109,680 | | |
| Total | 600 | 102 | 70,900 | 2,127 | 3,657,900 | 109,800 | 74,500 | 2,635 |

| Species | Spears | | Dredges | | Grabs | | By hand | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders | 46,500 | $3,690 | | | | | | |
| Crabs: | | | | | | | | |
| Hard | | | | | | | 128,500 | $1,955 |
| Soft and peelers | | | | | | | 4,800 | 216 |
| Oysters, market: | | | | | | | | |
| Private, spring | | | 2,500 | $125 | 443,600 | $16,786 | 518,700 | 19,062 |
| Private, fall | | | 2,500 | 115 | 472,300 | 18,427 | 321,400 | 12,188 |
| Total | 46,500 | 3,690 | 5,000 | 240 | 915,900 | 35,213 | 973,400 | 33,421 |

## *Fisheries of South Carolina, 1938*—Continued

### OPERATING UNITS: BY COUNTIES

| Item | Beaufort | Charleston | Colleton | Georgetown | Horry | Jasper |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 26 | 43 | ----- | 6 | ----- | ----- |
| On boats and shore: | | | | | | |
| Regular | 319 | 185 | ----- | 76 | 54 | 20 |
| Casual | 112 | 207 | 60 | 245 | 74 | 3 |
| Total | 457 | 435 | 60 | 327 | 128 | 23 |
| Vessels: | | | | | | |
| Motor | 10 | 11 | ----- | 2 | ----- | ----- |
| Net tonnage | 66 | 109 | ----- | 16 | ----- | ----- |
| Sail | ----- | 1 | ----- | ----- | ----- | ----- |
| Net tonnage | ----- | 12 | ----- | ----- | ----- | ----- |
| Total vessels | 10 | 12 | ----- | 2 | ----- | ----- |
| Total net tonnage | 66 | 121 | ----- | 16 | ----- | ----- |
| Boats: | | | | | | |
| Motor | 9 | 16 | ----- | 18 | 4 | 1 |
| Other | 232 | 171 | 30 | 114 | 35 | 9 |
| Accessory boats | ----- | 10 | ----- | ----- | ----- | ----- |
| Apparatus: | | | | | | |
| Haul seines | 2 | 3 | ----- | 19 | 14 | ----- |
| Length, yards | 400 | 300 | ----- | 2, 385 | 3, 100 | ----- |
| Gill nets: | | | | | | |
| Anchor | 40 | ----- | 44 | 22 | ----- | ----- |
| Square yards | 5, 400 | ----- | 28, 600 | 33, 880 | ----- | ----- |
| Drift | ----- | 6 | 6 | 23 | ----- | ----- |
| Square yards | ----- | 3, 350 | 3, 460 | 42, 900 | ----- | ----- |
| Runaround | 3 | 4 | ----- | 31 | 10 | 1 |
| Square yards | 1, 700 | 1, 370 | ----- | 16, 600 | 2, 500 | 600 |
| Stake | ----- | ----- | ----- | 9 | 7 | ----- |
| Square yards | ----- | ----- | ----- | 9, 000 | 1, 925 | ----- |
| Lines: | | | | | | |
| Hand | ----- | 76 | ----- | 10 | 12 | ----- |
| Hooks | ----- | 108 | ----- | 10 | 12 | ----- |
| Troll | ----- | 8 | ----- | ----- | ----- | ----- |
| Hooks | ----- | 8 | ----- | ----- | ----- | ----- |
| Trot with baits or snoods | 43 | 82 | ----- | ----- | ----- | ----- |
| Baits or snoods | 25, 800 | 10, 048 | ----- | ----- | ----- | ----- |
| Dip nets | ----- | ----- | ----- | 6 | ----- | ----- |
| Cast nets | ----- | 26 | ----- | ----- | ----- | ----- |
| Otter trawls, shrimp | 17 | 15 | ----- | 8 | ----- | ----- |
| Yards at mouth | 353 | 321 | ----- | 140 | ----- | ----- |
| Pots, fish | 60 | 10 | ----- | 35 | ----- | ----- |
| Spears | 50 | ----- | ----- | 37 | 10 | ----- |
| Dredges, oyster | ----- | 1 | ----- | ----- | ----- | ----- |
| Yards at mouth | ----- | 2 | ----- | ----- | ----- | ----- |
| Grabs | 66 | 110 | ----- | ----- | ----- | ----- |

### CATCH: BY COUNTIES

| Species | Beaufort | | Charleston | | Colleton | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | ----- | ----- | 35, 100 | $2, 808 | ----- | ----- |
| Bonito | ----- | ----- | 300 | 9 | ----- | ----- |
| Catfish and bullheads | 10, 000 | $600 | 1, 000 | 30 | ----- | ----- |
| Croaker | ----- | ----- | 1, 100 | 33 | ----- | ----- |
| Drum: | | | | | | |
| Black | 15, 000 | 450 | 2, 500 | 100 | ----- | ----- |
| Red or redfish | 42, 500 | 2, 125 | 25, 500 | 1, 775 | ----- | ----- |
| Flounders | 33, 000 | 2, 640 | 5, 500 | 380 | ----- | ----- |
| Grunts | ----- | ----- | 2, 500 | 75 | ----- | ----- |
| Hickory shad | 500 | 10 | ----- | ----- | 1, 400 | $28 |
| King whiting or "kingfish" | 30, 000 | 600 | 25, 000 | 1, 250 | ----- | ----- |
| Mullet | 43, 000 | 1, 400 | 11, 000 | 445 | ----- | ----- |
| Porgies | ----- | ----- | 1, 000 | 13 | ----- | ----- |
| Sea bass | ----- | ----- | 96, 000 | 4, 875 | ----- | ----- |
| Sea catfish | ----- | ----- | 100, 000 | 3, 000 | ----- | ----- |
| Shad | 2, 500 | 500 | 13, 600 | 2, 992 | 13, 400 | 2, 680 |
| Sheepshead, salt-water | ----- | ----- | 2, 600 | 53 | ----- | ----- |
| Spot | 10, 500 | 210 | 3, 000 | 60 | ----- | ----- |
| Squeteagues or "sea trout," spotted | 46, 500 | 4, 295 | 15, 000 | 1, 400 | ----- | ----- |
| Sturgeon | ----- | ----- | ----- | ----- | 9, 300 | 1, 027 |
| Crabs: | | | | | | |
| Hard | 626, 200 | 11, 884 | 217, 100 | 3, 284 | ----- | ----- |
| Soft and peelers | ----- | ----- | 4, 800 | 216 | ----- | ----- |
| Shrimp | 2, 641, 600 | 79, 038 | 842, 000 | 25, 270 | ----- | ----- |
| Oysters, market: | | | | | | |
| Private, spring | 610, 900 | 22, 832 | 341, 400 | 12, 678 | ----- | ----- |
| Private, fall | 393, 800 | 15, 231 | 379, 800 | 14, 621 | ----- | ----- |
| Total | 4, 506, 000 | 141, 815 | 2, 125, 800 | 75, 367 | 24, 100 | 3, 735 |

## *Fisheries of South Carolina, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Georgetown |  | Horry |  | Jasper |  |
|---|---|---|---|---|---|---|
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 7,500 | $405 |  |  |  |  |
| Catfish and bullheads | 62,000 | 1,860 |  |  |  |  |
| Drum: |  |  |  |  |  |  |
| Black | 10,500 | 510 |  |  |  |  |
| Red or redfish | 29,000 | 1,605 | 4,000 | $190 | 2,500 | $125 |
| Flounders | 20,000 | 1,600 | 7,000 | 520 |  |  |
| Hickory shad | 2,900 | 49 | 3,700 | 113 |  |  |
| King whiting or "kingfish" | 6,000 | 120 | 25,000 | 1,000 |  |  |
| Mullet | 383,000 | 14,990 | 145,000 | 5,750 | 5,000 | 200 |
| Sea bass | 7,500 | 750 | 8,000 | 640 |  |  |
| Shad | 25,000 | 4,858 | 4,900 | 980 |  |  |
| Sheepshead, salt-water | 300 | 12 |  |  |  |  |
| Spot | 110,300 | 2,456 | 70,000 | 1,850 | 2,000 | 60 |
| Squeteagues or "sea trout": |  |  |  |  |  |  |
| Gray | 5,000 | 350 |  |  |  |  |
| Spotted | 13,300 | 1,264 | 3,000 | 300 | 1,000 | 100 |
| Striped bass | 600 | 108 |  |  |  |  |
| Sturgeon | 16,400 | 1,476 |  |  |  |  |
| Shrimp | 239,200 | 7,499 |  |  |  |  |
| Oysters, market: |  |  |  |  |  |  |
| Private, spring | 1,600 | 60 |  |  | 10,900 | 403 |
| Private, fall | 3,800 | 144 |  |  | 18,800 | 734 |
| Total | 943,900 | 40,116 | 270,600 | 11,343 | 40,200 | 1,622 |

## GEORGIA

## *Fisheries of Georgia, 1938*

OPERATING UNITS: BY GEAR

| Item | Purse seines, menhaden | Haul seines | Gill nets |  |  |  | Lines |  |  |
|---|---|---|---|---|---|---|---|---|---|
|  |  |  | Anchor | Drift | Runaround | Stake | Hand | Trot with baits or snoods | Trot with hooks |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 45 |  |  |  |  |  |  |  |  |
| On boats and shore: |  |  |  |  |  |  |  |  |  |
| Regular |  | 18 |  | 5 | 12 |  | 8 | 154 |  |
| Casual |  | 2 | 8 | 180 | 16 | 68 | 22 | 52 | 26 |
| Total | 45 | 20 | 8 | 185 | 28 | 68 | 30 | 206 | 26 |
| Vessels, motor | 2 |  |  |  |  |  |  |  |  |
| Net tonnage | 92 |  |  |  |  |  |  |  |  |
| Boats: |  |  |  |  |  |  |  |  |  |
| Motor |  |  |  | 10 | 6 |  |  | 16 |  |
| Other |  | 10 | 4 | 86 | 20 | 38 | 12 | 152 | 25 |
| Accessory boats | 6 |  |  |  |  |  |  |  |  |
| Apparatus: |  |  |  |  |  |  |  |  |  |
| Number | 2 | 10 | 16 | 96 | 28 | 142 | 150 | 202 | 45 |
| Length, yards | 600 | 898 |  |  |  |  |  |  |  |
| Square yards |  |  | 770 | 43,110 | 8,480 | 15,665 |  |  |  |
| Hooks, baits, or snoods |  |  |  |  |  |  | 150 | 82,300 | 5,325 |

## *Fisheries of Georgia, 1938*—Continued

### OPERATING UNITS: BY GEAR—Continued

| Item | Otter trawls, shrimp | Pots | | Tongs, oyster | Grabs | By hand | | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| | | Crab | Fish | | | Oyster | Other | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 160 | | | | | | | 205 |
| On boats and shore: | | | | | | | | |
| Regular | 316 | 49 | | 9 | 15 | 4 | | 552 |
| Casual | 3 | 16 | 4 | 13 | 15 | 16 | 12 | 416 |
| Total | 479 | 65 | 4 | 22 | 30 | 20 | 12 | 1,173 |
| Vessels, motor | 72 | | | | | | | 74 |
| Net tonnage | 570 | | | | | | | 662 |
| Boats: | | | | | | | | |
| Motor | 157 | 2 | | | | | | 188 |
| Other | | 56 | 2 | 22 | 30 | 20 | | 428 |
| Accessory boats | | | | | | | | 6 |
| Apparatus: | | | | | | | | |
| Number | 229 | 620 | 44 | 22 | 30 | | | |
| Yards at mouth | 4,657 | | | | | | | |

### CATCH: BY GEAR

| Species | Purse seines | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Anchor | | Drift | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders | | | 500 | $10 | | | | |
| Hickory shad | | | | | | | 2,900 | $92 |
| Menhaden | 7,033,800 | $9,888 | | | | | | |
| Mullet | | | 1,500 | 30 | | | | |
| Shad | | | | | 4,200 | $772 | 70,300 | 12,952 |
| Spot | | | 1,500 | 30 | | | | |
| Squeteagues or "sea trout," spotted | | | 2,500 | 250 | | | | |
| Sturgeon | | | | | | | 7,800 | 1,462 |
| Terrapin, diamond-back | | | 6,700 | 838 | | | | |
| Total | 7,033,800 | 9,888 | 12,700 | 1,158 | 4,200 | 772 | 81,000 | 14,506 |

| Species | Gill nets—Continued | | | | Lines | | | |
|---|---|---|---|---|---|---|---|---|
| | Runaround | | Stake | | Hand | | Trot with baits or snoods | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | 2,500 | $100 | | | | | | |
| Drum: | | | | | | | | |
| Black | 5,000 | 200 | | | | | | |
| Red or redfish | 27,500 | 1,275 | | | | | | |
| Hickory shad | | | 1,100 | $43 | | | | |
| King whiting or "kingfish" | 5,000 | 75 | | | | | | |
| Mullet | 15,500 | 385 | | | | | | |
| Shad | | | 23,600 | 4,255 | | | | |
| Sheepshead, salt-water | 5,000 | 150 | | | | | | |
| Spot | 2,500 | 50 | | | | | | |
| Squeteagues or "sea trout," spotted | 60,000 | 6,000 | | | | | | |
| Crabs, hard | | | | | 90,000 | $1,350 | 1,397,700 | $20,990 |
| Total | 123,000 | 8,235 | 24,700 | 4,298 | 90,000 | 1,350 | 1,397,700 | 20,990 |

## *Fisheries of Georgia, 1938*—Continued

### CATCH: BY GEAR—Continued

| Species | Lines—Contd. |  | Otter trawls |  | Pots |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  | Trot with hooks |  |  |  | Crab |  | Fish |  |
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Catfish and bullheads | 7,700 | $470 |  |  |  |  | 31,400 | $1,256 |
| Eels, common |  |  |  |  |  |  | 1,500 | 165 |
| Flounders |  |  | 7,500 | $375 |  |  |  |  |
| King whiting or "kingfish" |  |  | 70,000 | 1,050 |  |  |  |  |
| Crabs, hard |  |  | 20,000 | 300 | 346,500 | $5,188 |  |  |
| Shrimp |  |  | 10,425,700 | 302,261 |  |  |  |  |
| Total | 7,700 | 470 | 10,523,200 | 303,986 | 346,500 | 5,188 | 32,900 | 1,421 |

| Species | Tongs |  | Grabs |  | By hand |  |
|---|---|---|---|---|---|---|
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Oysters, market: |  |  |  |  |  |  |
| Private, spring | 20,000 | $1,051 | 42,500 | $2,341 | 24,600 | $1,174 |
| Private, fall | 13,400 | 674 | 30,500 | 1,708 | 23,000 | 1,090 |
| Terrapin, diamond-back |  |  |  |  | 4,200 | 588 |
| Total | 33,400 | 1,725 | 73,000 | 4,049 | 51,800 | 2,852 |

### OPERATING UNITS: BY COUNTIES

| Item | Bryan | Bullock | Camden | Charlton | Chatham | Effingham |
|---|---|---|---|---|---|---|
|  | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: |  |  |  |  |  |  |
| On vessels |  |  | 70 |  | 37 |  |
| On boats and shore: |  |  |  |  |  |  |
| Regular |  |  | 57 |  | 94 |  |
| Casual | 32 | 16 | 37 | 10 | 100 | 8 |
| Total | 32 | 16 | 164 | 10 | 231 | 8 |
| Vessels, motor |  |  | 13 |  | 15 |  |
| Net tonnage |  |  | 185 |  | 166 |  |
| Boats: |  |  |  |  |  |  |
| Motor |  |  | 15 |  | 31 |  |
| Other | 16 | 8 | 58 | 5 | 97 | 4 |
| Accessory boats |  |  | 6 |  |  |  |
| Apparatus: |  |  |  |  |  |  |
| Purse seines, menhaden |  |  | 2 |  |  |  |
| Length, yards |  |  | 600 |  |  |  |
| Haul seines |  |  |  |  | 6 |  |
| Length, yards |  |  |  |  | 498 |  |
| Gill nets: |  |  |  |  |  |  |
| Anchor |  |  |  |  |  | 16 |
| Square yards |  |  |  |  |  | 770 |
| Drift | 12 |  | 7 |  | 23 |  |
| Square yards | 5,400 |  | 4,150 |  | 8,020 |  |
| Runaround |  |  |  |  | 12 |  |
| Square yards |  |  |  |  | 6,000 |  |
| Stake | 16 | 80 | 5 | 5 |  |  |
| Square yards | 1,840 | 3,200 | 6,000 | 2,800 |  |  |
| Lines: |  |  |  |  |  |  |
| Hand |  |  |  |  | 150 |  |
| Hooks |  |  |  |  | 150 |  |
| Trot with baits or snoods |  |  | 45 |  | 25 |  |
| Baits or snoods |  |  | 19,500 |  | 9,850 |  |
| Trot with hooks |  | 6 |  |  |  |  |
| Hooks |  | 600 |  |  |  |  |
| Otter trawls, shrimp |  |  | 24 |  | 43 |  |
| Yards at mouth |  |  | 474 |  | 890 |  |
| Pots, crab |  |  | 40 |  | 370 |  |
| Tongs, oyster |  |  |  |  | 12 |  |

## *Fisheries of Georgia, 1938*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Glynn | Liberty | Long | McIntosh | Screven | Tattnall | Wayne |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 75 | -------- | -------- | 23 | -------- | -------- | -------- |
| On boats and shore: | | | | | | | |
| Regular | 165 | 26 | -------- | 210 | -------- | -------- | -------- |
| Casual | 55 | 25 | 8 | 70 | 8 | 34 | 13 |
| Total | 295 | 51 | 8 | 303 | 8 | 34 | 13 |
| Vessels, motor | 35 | -------- | -------- | 11 | -------- | -------- | -------- |
| Net tonnage | 239 | -------- | -------- | 72 | -------- | -------- | -------- |
| Boats: | | | | | | | |
| Motor | 71 | -------- | -------- | 64 | -------- | 5 | 2 |
| Other | 64 | 31 | 4 | 116 | 8 | 12 | 5 |
| Apparatus: | | | | | | | |
| Haul seines | 4 | -------- | -------- | -------- | -------- | -------- | -------- |
| Length, yards | 400 | -------- | -------- | -------- | -------- | -------- | -------- |
| Gill nets: | | | | | | | |
| Drift | 15 | -------- | 2 | 20 | -------- | 12 | 5 |
| Square yards | 9,300 | -------- | 260 | 11,500 | -------- | 4,080 | 400 |
| Runaround | 16 | -------- | -------- | -------- | -------- | -------- | -------- |
| Square yards | 2,480 | -------- | -------- | -------- | -------- | -------- | -------- |
| Stake | -------- | -------- | 8 | -------- | 16 | 10 | 2 |
| Square yards | -------- | -------- | 480 | -------- | 780 | 500 | 65 |
| Lines: | | | | | | | |
| Trot with baits or snoods | 44 | 35 | -------- | 53 | -------- | -------- | -------- |
| Baits or snoods | 23,700 | 8,750 | -------- | 20,500 | -------- | -------- | -------- |
| Trot with hooks | -------- | -------- | 8 | -------- | 5 | 16 | 10 |
| Hooks | -------- | -------- | 800 | -------- | 425 | 2,500 | 1,000 |
| Otter trawls, shrimp | 90 | -------- | -------- | 72 | -------- | -------- | -------- |
| Yards at mouth | 1,894 | -------- | -------- | 1,399 | -------- | -------- | -------- |
| Pots: | | | | | | | |
| Crab | 60 | 50 | -------- | 100 | -------- | -------- | -------- |
| Fish | -------- | -------- | -------- | 44 | -------- | -------- | -------- |
| Tongs, oyster | 6 | -------- | -------- | 4 | -------- | -------- | -------- |
| Grabs | -------- | -------- | -------- | 30 | -------- | -------- | -------- |

### CATCH: BY COUNTIES

| Species | Bryan | | Bullock | | Camden | | Charlton | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Catfish and bullheads | -------- | -------- | 1,500 | $90 | -------- | -------- | -------- | -------- |
| Hickory shad | -------- | -------- | -------- | -------- | 500 | $20 | -------- | -------- |
| Menhaden | -------- | -------- | -------- | -------- | 7,033,800 | 9,888 | -------- | -------- |
| Shad | 18,900 | $3,308 | 2,200 | 440 | 15,900 | 2,703 | 4,800 | $816 |
| Sturgeon | -------- | -------- | -------- | -------- | 1,100 | 110 | -------- | -------- |
| Crabs, hard | -------- | -------- | -------- | -------- | 250,000 | 3,750 | -------- | -------- |
| Shrimp | -------- | -------- | -------- | -------- | 1,725,200 | 51,756 | -------- | -------- |
| Total | 18,900 | 3,308 | 3,700 | 530 | 9,026,500 | 68,227 | 4,800 | 816 |

| Species | Chatham | | Effingham | | Glynn | | Liberty | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | -------- | -------- | -------- | -------- | 2,500 | $100 | -------- | -------- |
| Drum: | | | | | | | | |
| Black | | | | | 5,000 | 200 | -------- | -------- |
| Red or redfish | 7,500 | $375 | -------- | -------- | 20,000 | 900 | -------- | -------- |
| Flounders | 7,500 | 375 | -------- | -------- | 500 | 10 | -------- | -------- |
| Hickory shad | 500 | 15 | -------- | -------- | 1,300 | 34 | -------- | -------- |
| King whiting or "kingfish" | 50,000 | 750 | -------- | -------- | 25,000 | 375 | -------- | -------- |
| Mullet | 7,500 | 225 | -------- | -------- | 9,500 | 190 | -------- | -------- |
| Shad | 26,900 | 5,380 | 4,200 | $772 | 5,900 | 1,005 | -------- | -------- |
| Sheepshead, salt-water | -------- | -------- | -------- | -------- | 5,000 | 150 | -------- | -------- |
| Spot | 2,500 | 50 | -------- | -------- | 1,500 | 30 | -------- | -------- |
| Squeteagues or "sea trout," spotted | 35,000 | 3,500 | -------- | -------- | 27,500 | 2,750 | -------- | -------- |
| Crabs, hard | 448,000 | 6,720 | -------- | -------- | 560,700 | 8,410 | 150,000 | $2,250 |
| Shrimp | 2,739,700 | 83,591 | -------- | -------- | 2,540,800 | 76,194 | -------- | -------- |
| Oysters, market: | | | | | | | | |
| Private, spring | 32,400 | 1,620 | -------- | -------- | 700 | 41 | 5,100 | 199 |
| Private, fall | 32,400 | 1,620 | -------- | -------- | 500 | 29 | 3,500 | 115 |
| Terrapin, diamond-back | 8,400 | 1,176 | -------- | -------- | 2,500 | 250 | -------- | -------- |
| Total | 3,398,300 | 105,397 | 4,200 | 772 | 3,208,900 | 90,668 | 158,600 | 2,564 |

*Fisheries of Georgia, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Long | | McIntosh | | Screven | | Tattnall | | Wayne | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Catfish and bullheads | 500 | $35 | 31,400 | $1,256 | 1,200 | $70 | 2,500 | $125 | 2,000 | $150 |
| Eels, common | ------ | ------ | 1,500 | 165 | ------ | ------ | ------ | ------ | ------ | ------ |
| Hickory shad | 200 | 6 | 500 | 20 | ------ | ------ | ------ | ------ | 1,000 | 40 |
| Shad | 1,400 | 280 | 7,500 | 1,275 | 2,400 | 400 | 4,800 | 960 | 3,200 | 640 |
| Sturgeon | ------ | ------ | 6,500 | 1,300 | ------ | ------ | ------ | ------ | 200 | 52 |
| Crabs, hard | ------ | ------ | 445,500 | 6,698 | ------ | ------ | ------ | ------ | ------ | ------ |
| Shrimp | ------ | ------ | 3,420,000 | 90,720 | ------ | ------ | ------ | ------ | ------ | ------ |
| Oysters, market: | | | | | | | | | | |
| Private, spring | ------ | ------ | 48,900 | 2,706 | ------ | ------ | ------ | ------ | ------ | ------ |
| Private, fall | ------ | ------ | 30,500 | 1,708 | ------ | ------ | ------ | ------ | ------ | ------ |
| Total | 2,100 | 321 | 3,992,300 | 105,848 | 3,600 | 470 | 7,300 | 1,085 | 6,400 | 882 |

## FLORIDA

### *Fisheries of Florida, 1938*

OPERATING UNITS: BY GEAR

| Item | Purse seines, menhaden | Haul seines, common | Gill nets | | | | Trammel nets |
|---|---|---|---|---|---|---|---|
| | | | Anchor | Drift | Runaround | Stake | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 373 | 8 | ------ | ------ | 21 | ------ | 18 |
| On boats and shore: | | | | | | | |
| Regular | ------ | 922 | 14 | 95 | 2,504 | 2 | 874 |
| Casual | ------ | 147 | 4 | 10 | 77 | 4 | 13 |
| Total | 373 | 1,077 | 18 | 105 | 2,602 | 6 | 905 |
| Vessel, motor | 19 | 1 | ------ | ------ | 7 | ------ | 6 |
| Net tonnage | 827 | 5 | ------ | ------ | 48 | ------ | 43 |
| Boats: | | | | | | | |
| Motor | ------ | 202 | 10 | 38 | 1,085 | 2 | 354 |
| Other | ------ | 317 | 7 | 64 | 1,898 | 2 | 446 |
| Accessory boats | 48 | ------ | ------ | ------ | 3 | ------ | ------ |
| Apparatus: | | | | | | | |
| Number | 19 | 238 | 18 | 71 | 2,198 | 4 | 621 |
| Length, yards | 5,320 | 124,315 | ------ | ------ | ------ | ------ | ------ |
| Square yards | ------ | ------ | 13,500 | 88,700 | 2,325,660 | 3,600 | 519,745 |

| Item | Lines | | | | | Pound nets | Fyke nets |
|---|---|---|---|---|---|---|---|
| | Hand | Trawl | Troll | Trot with baits or snoods | Trot with hooks | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 503 | 2 | 2 | ------ | ------ | ------ | ------ |
| On boats and shore: | | | | | | | |
| Regular | 857 | 28 | 583 | 160 | 185 | 12 | 2 |
| Casual | 605 | ------ | 261 | 25 | 45 | ------ | ------ |
| Total | 1,965 | 30 | 846 | 185 | 230 | 12 | 2 |
| Vessels: | | | | | | | |
| Motor | 63 | 1 | 1 | ------ | ------ | ------ | ------ |
| Net tonnage | 2,028 | 15 | 5 | ------ | ------ | ------ | ------ |
| Sail | 1 | ------ | ------ | ------ | ------ | ------ | ------ |
| Net tonnage | 9 | ------ | ------ | ------ | ------ | ------ | ------ |
| Total vessels | 64 | 1 | 1 | ------ | ------ | ------ | ------ |
| Total net tonnage | 2,037 | 15 | 5 | ------ | ------ | ------ | ------ |
| Boats: | | | | | | | |
| Motor | 629 | 14 | 467 | 93 | 85 | 10 | 1 |
| Other | 370 | ------ | 14 | 68 | 110 | 1 | ------ |
| Apparatus: | | | | | | | |
| Number | 1,965 | 35 | 995 | 151 | 219 | 24 | 8 |
| Hooks, baits, or snoods | 2,600 | 2,040 | 995 | 83,550 | 76,155 | ------ | ------ |

## *Fisheries of Florida, 1938*—Continued

### OPERATING UNITS: BY GEAR—Continued

| Item | Dip nets | | Cast nets | Otter trawl, shrimp | Pots | | | |
|---|---|---|---|---|---|---|---|---|
| | Common | Drop | | | Crab | Eel | Fish | Sea crawfish |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | -------- | -------- | -------- | 288 | -------- | -------- | -------- | -------- |
| On boats and shore: | | | | | | | | |
| Regular | 41 | -------- | 87 | 362 | 77 | 4 | 64 | 24 |
| Casual | 22 | 12 | 118 | 25 | 20 | -------- | 12 | 4 |
| Total | 63 | 12 | 205 | 675 | 97 | 4 | 76 | 28 |
| Vessels, motor | -------- | -------- | -------- | 123 | -------- | -------- | -------- | -------- |
| Net tonnage | -------- | -------- | -------- | 972 | -------- | -------- | -------- | -------- |
| Boats: | | | | | | | | |
| Motor | 20 | -------- | 8 | 196 | 49 | 4 | 35 | 18 |
| Other | 14 | -------- | 107 | -------- | 22 | -------- | 58 | -------- |
| Apparatus: | | | | | | | | |
| Number | 57 | 24 | 205 | 319 | 6,890 | 71 | 5,110 | 2,050 |
| Yards at mouth | -------- | -------- | -------- | 6,124 | -------- | -------- | -------- | -------- |

| Item | Spears | Dredges | | | Tongs, oyster | Forks | Grabs | Coquina scoops |
|---|---|---|---|---|---|---|---|---|
| | | Clam | Oyster | Scallop | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | -------- | -------- | 6 | -------- | 6 | -------- | -------- | -------- |
| On boats and shore: | | | | | | | | |
| Regular | 66 | 12 | 9 | 53 | 277 | 4 | 17 | -------- |
| Casual | 91 | -------- | -------- | -------- | 67 | 7 | 4 | 4 |
| Total | 157 | 12 | 15 | 53 | 350 | 11 | 21 | 4 |
| Vessels, motor | -------- | -------- | 2 | -------- | 2 | -------- | -------- | -------- |
| Net tonnage | -------- | -------- | 14 | -------- | 11 | -------- | -------- | -------- |
| Boats: | | | | | | | | |
| Motor | -------- | -------- | 3 | 28 | 91 | -------- | 6 | -------- |
| Other | 41 | 1 | -------- | -------- | 161 | -------- | 3 | 4 |
| Apparatus: | | | | | | | | |
| Number | 157 | 1 | 10 | 54 | 331 | 11 | 21 | 4 |
| Yards at mouth | -------- | -------- | 10 | 50 | -------- | -------- | -------- | -------- |

| Item | Hooks | | Diving outfits | By hand | | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| | Sponge | Stone crab | | Oyster | Other | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | -------- | -------- | 96 | -------- | -------- | 1,283 |
| On boats and shore: | | | | | | |
| Regular | 410 | 13 | 413 | 44 | 32 | 5,975 |
| Casual | -------- | 3 | -------- | 27 | 25 | 1,467 |
| Total | 410 | 16 | 509 | 71 | 57 | 8,725 |
| Vessels: | | | | | | |
| Motor | -------- | -------- | 13 | -------- | -------- | 226 |
| Net tonnage | -------- | -------- | 135 | -------- | -------- | 4,025 |
| Sail | -------- | -------- | -------- | -------- | -------- | 1 |
| Net tonnage | -------- | -------- | -------- | -------- | -------- | 9 |
| Total vessels | -------- | -------- | 13 | -------- | -------- | 227 |
| Total net tonnage | -------- | -------- | 135 | -------- | -------- | 4,034 |
| Boats: | | | | | | |
| Motor | -------- | 6 | 59 | -------- | 4 | 2,562 |
| Other | 290 | 3 | -------- | 37 | 16 | 3,462 |
| Accessory boats | -------- | -------- | -------- | -------- | -------- | 51 |
| Apparatus: | | | | | | |
| Number | 292 | 10 | 72 | -------- | -------- | 9 |
| Hooks, baits, or snoods | -------- | -------- | -------- | -------- | -------- | 8 |

## *Fisheries of Florida, 1938*—Continued

### CATCH: BY GEAR

| Species | Purse seines | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Anchor | | Drift | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 391, 600 | $1, 959 | | | | |
| Bluefish | | | 520, 700 | 18, 276 | | | | |
| Blue runner or hardtail | | | 581, 400 | 5, 997 | | | | |
| Cabio or crab eater | | | 200 | 5 | | | | |
| Catfish and bullheads | | | 2, 245, 800 | 77, 043 | | | | |
| Cigarfish | | | 9, 000 | 180 | | | | |
| Crappie | | | 209, 400 | 7, 284 | | | | |
| Crevalle | | | 80, 700 | 1, 353 | | | | |
| Croaker | | | 4, 900 | 93 | | | | |
| Drum: | | | | | | | | |
| Black | | | 27, 000 | 725 | | | | |
| Red or redfish | | | 202, 700 | 6, 232 | | | | |
| Flounders | | | 21, 100 | 811 | | | | |
| Groupers | | | 5, 000 | 125 | | | | |
| Grunts | | | 3, 000 | 60 | | | | |
| Hickory shad | | | 31, 100 | 1, 137 | | | 1, 300 | $39 |
| Hogfish | | | 1, 000 | 30 | | | | |
| Jewfish | | | 6, 600 | 213 | | | | |
| Kingfish or "king mackerel" | | | 32, 600 | 865 | | | | |
| King whiting or "kingfish" | | | 65, 600 | 1, 025 | | | | |
| Menhaden | 149, 085, 700 | $385, 032 | 183, 000 | 3, 040 | | | | |
| Mojarra | | | 68, 800 | 1, 495 | | | | |
| Mullet | | | 5, 398, 700 | 169, 838 | | | | |
| Permit | | | 3, 000 | 60 | | | | |
| Pigfish | | | 22, 700 | 254 | | | | |
| Pinfish or sailors choice | | | 1, 500 | 23 | | | | |
| Pompano | | | 77, 100 | 16, 596 | | | | |
| Porgies | | | 900 | 15 | | | | |
| Sea catfish | | | 10, 100 | 182 | | | | |
| Shad | | | 115, 800 | 9, 632 | 2, 200 | $264 | 106, 900 | 11, 275 |
| Sheepshead, salt-water | | | 70, 300 | 1, 739 | | | | |
| Snapper, mangrove | | | 26, 800 | 1, 177 | | | | |
| Snook or sergeant fish | | | 107, 600 | 3, 880 | | | | |
| Spadefish | | | 1, 800 | 33 | | | | |
| Spanish mackerel | | | 906, 100 | 34, 373 | | | | |
| Spot | | | 38, 200 | 781 | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | | | 348, 600 | 21, 947 | | | | |
| White | | | 6, 500 | 220 | | | | |
| Sturgeon | | | | | 8, 500 | 850 | 25, 500 | 2, 210 |
| Sunfish | | | 695, 200 | 25, 317 | | | | |
| Tenpounder | | | 352, 400 | 6, 673 | | | | |
| Tripletail | | | 15, 400 | 231 | | | | |
| Yellowtail | | | 100 | 6 | | | | |
| Turtles: | | | | | | | | |
| Green | | | | | 8, 200 | 310 | | |
| Loggerhead | | | | | 800 | 16 | | |
| Soft-shell | | | 80, 100 | 1, 591 | | | | |
| Total | 149, 085, 700 | 385, 032 | 12, 970, 100 | 422, 516 | 19, 700 | 1, 440 | 133, 700 | 13, 524 |

| Species | Gill nets—Continued | | | | Trammel nets | | Lines | |
|---|---|---|---|---|---|---|---|---|
| | Runaround | | Stake | | | | Hand | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Amberjack | 100 | $2 | | | | | 21, 800 | $477 |
| Angelfish | 100 | 4 | | | 400 | $14 | 200 | 4 |
| Bluefish | 3, 763, 900 | 177, 561 | | | 41, 500 | 2, 498 | 63, 400 | 2, 801 |
| Blue runner or hardtail | 78, 700 | 1, 682 | | | 40, 500 | 600 | 2, 900 | 64 |
| Cabio or crab eater | 3, 300 | 91 | | | | | 3, 900 | 102 |
| Catfish and bull heads | | | | | | | 12, 100 | 382 |
| Crevalle | 100, 600 | 1, 927 | | | 2, 500 | 85 | 6, 700 | 151 |
| Croaker | 8, 100 | 161 | | | | | | |
| Dolphin | | | | | | | 100 | 3 |
| Drum: | | | | | | | | |
| Black | 32, 900 | 843 | | | | | 3, 800 | 114 |
| Red or redfish | 465, 000 | 15, 291 | | | 225, 900 | 8, 045 | 228, 400 | 7, 307 |
| Flounders | 36, 200 | 1, 208 | | | 23, 200 | 1, 012 | 6, 300 | 228 |
| Groupers | 19, 700 | 1, 119 | | | | | 4, 348, 100 | 135, 906 |
| Grunts | 9, 300 | 371 | | | | | 26, 000 | 577 |
| Hogfish | 5, 000 | 150 | | | | | 5, 800 | 290 |
| Jewfish | 3, 900 | 132 | | | | | 115, 900 | 4, 164 |

## *Fisheries of Florida, 1938*—Continued

### CATCH: BY GEAR—Continued

| Species | Gill nets—Continued | | | | Trammel nets | | Lines | |
|---|---|---|---|---|---|---|---|---|
| | Runaround | | Stake | | | | Hand | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Kingfish or "king mackerel" | 154,200 | $5,397 | | | | | 2,000 | $70 |
| King whiting or "kingfish" | 37,400 | 845 | | | 4,500 | $90 | | |
| Menhaden | 400 | 4 | | | | | | |
| Mojarra | 249,000 | 5,876 | | | 1,600 | 48 | 6,300 | 166 |
| Moonfish | | | | | | | 300 | 6 |
| Mullet | 20,895,400 | 696,172 | | | 2,186,900 | 70,891 | | |
| Muttonfish | 72,800 | 4,878 | | | | | 208,100 | 12,581 |
| Permit | 3,300 | 81 | | | 8,400 | 178 | 1,000 | 21 |
| Pigfish | 24,600 | 459 | | | 1,400 | 52 | 500 | 10 |
| Pinfish or sailors choice | 22,200 | 276 | | | | | | |
| Pompano | 144,600 | 30,937 | | | 548,600 | 112,588 | 7,800 | 1,510 |
| Porgies | 10,800 | 369 | | | | | 42,200 | 1,421 |
| Sea bass | 22,500 | 900 | | | | | 600 | 24 |
| Sea catfish | 2,000 | 40 | | | 5,400 | 107 | | |
| Shad | | | 3,800 | $608 | | | | |
| Sheepshead, salt-water | 528,100 | 11,131 | | | 77,200 | 2,685 | 100,500 | 2,890 |
| Snapper: | | | | | | | | |
| Lane | | | | | | | 2,200 | 110 |
| Mangrove | 125,500 | 3,524 | | | 16,900 | 573 | 126,400 | 4,199 |
| Red | | | | | | | 5,359,600 | 377,701 |
| Snook or sergeant fish | 204,500 | 7,644 | | | 8,500 | 218 | 281,300 | 9,003 |
| Spadefish | 3,300 | 69 | | | | | | |
| Spanish mackerel | 5,538,800 | 262,027 | | | 21,200 | 813 | 43,500 | 1,345 |
| Spot | 126,100 | 2,710 | | | 61,400 | 2,330 | 2,900 | 57 |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 1,493,300 | 94,466 | | | 434,900 | 29,784 | 1,132,100 | 73,287 |
| White | 29,500 | 1,223 | | | 600 | 20 | 16,400 | 697 |
| Sturgeon | | | 2,000 | 160 | | | | |
| Swellfish | | | | | | | 500 | 40 |
| Tenpounder | 2,400 | 54 | | | 2,400 | 57 | | |
| Tripletail | 700 | 21 | | | | | 1,800 | 35 |
| Turbot | | | | | | | 1,800 | 36 |
| Yellowtail | 2,200 | 193 | | | | | 163,300 | 13,538 |
| Sea crawfish or spiny lobster | 31,300 | 1,507 | | | | | | |
| Total | 34,251,700 | 1,334,345 | 5,800 | 768 | 3,713,900 | 232,688 | 12,346,500 | 651,317 |

| Species | Lines—Continued | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Trawl | | Troll | | Trot with baits or snoods | | Trot with hooks | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Amberjack | | | 2,500 | $62 | | | | |
| Barracuda | | | 500 | 20 | | | | |
| Bluefish | | | 86,500 | 3,860 | | | | |
| Catfish and bullheads | | | | | | | 1,433,600 | $55,974 |
| Dolphin | | | 2,500 | 120 | | | | |
| Groupers | | | 3,900 | 143 | | | | |
| Kingfish or "king mackerel" | | | 3,476,400 | 130,045 | | | | |
| King whiting or "kingfish" | | | 300 | 10 | | | | |
| Sea catfish | | | | | | | 50,200 | 1,004 |
| Sharks | 3,100,600 | $22,335 | | | | | | |
| Snook or sergeantfish | | | 7,000 | 195 | | | | |
| Spanish mackerel | | | 318,800 | 15,719 | | | | |
| Spot | | | 100 | 4 | | | | |
| Squeteagues or "sea trout," spotted | | | 2,200 | 155 | | | | |
| Sunfish | | | | | | | 400 | 14 |
| Crabs, hard | | | | | 3,996,000 | $49,279 | | |
| Turtles, soft-shell | | | | | | | 119,800 | 2,361 |
| Total | 3,100,600 | 22,335 | 3,900,700 | 150,333 | 3,996,000 | 49,279 | 1,604,000 | 59,353 |

*Fisheries of Florida, 1938*—Continued

CATCH: By gear—Continued

| Species | Pound nets | | Fyke nets | | Dip nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Common | | Drop | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 4,000 | $320 | | | | | | |
| Blue runner or hardtail | 3,000 | 105 | | | | | | |
| Catfish and bullheads | 82,200 | 3,288 | 12,000 | $480 | | | | |
| Jewfish | 2,000 | 50 | | | | | | |
| Spanish mackerel | 7,000 | 245 | | | | | | |
| Squeteagues or "sea trout," spotted | 1,000 | 80 | | | | | | |
| Tenpounder | 2,000 | 70 | | | | | | |
| Crabs: | | | | | | | | |
| Hard | | | | | 16,500 | $495 | 5,300 | $245 |
| Stone | | | | | 7,700 | 1,386 | | |
| Sea crawfish or spiny lobster | | | | | 44,600 | 2,428 | | |
| Shrimp | | | | | 45,000 | 2,925 | | |
| Scallops, bay | | | | | 5,300 | 391 | | |
| Total | 101,200 | 4,158 | 12,000 | 480 | 119,100 | 7,625 | 5,300 | 245 |

| Species | Cast nets | | Otter trawls | | Pots | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Crab | | Eel | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Blue runner or hardtail | 200 | $7 | | | | | | |
| Eels, common | | | | | | | 9,800 | $243 |
| Flounders | | | 29,300 | $1,278 | | | | |
| Groupers | | | 1,600 | 39 | | | | |
| King whiting or "kingfish" | | | 223,000 | 3,555 | | | | |
| Mojarra | 7,800 | 224 | | | | | | |
| Mullet | 112,900 | 4,359 | | | | | | |
| Sea bass | | | 2,300 | 46 | | | | |
| Sheepshead, salt-water | 1,400 | 49 | | | | | | |
| Snapper, red | | | 18,300 | 732 | | | | |
| Spot | 300 | 11 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 1,100 | 77 | | | | | | |
| White | | | 1,400 | 28 | | | | |
| Swellfish | 500 | 40 | | | | | | |
| Crabs: | | | | | | | | |
| Hard | | | 20,000 | 300 | 1,557,100 | $25,951 | | |
| Stone | | | | | 37,400 | 8,192 | | |
| Shrimp | 157,300 | 7,733 | 9,910,300 | 307,954 | | | | |
| Total | 281,500 | 12,500 | 10,236,200 | 313,932 | 1,594,500 | 34,143 | 9,800 | 243 |

| Species | Pots—Continued | | | | Spears | | Dredges | |
|---|---|---|---|---|---|---|---|---|
| | Fish | | Sea crawfish | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Angelfish | 500 | $10 | | | | | | |
| Blue runner or hardtail | 25,000 | 625 | | | | | | |
| Catfish and bullheads | 271,800 | 10,372 | | | | | | |
| Crappie | 343,300 | 11,768 | | | | | | |
| Flounders | | | | | 73,900 | $4,232 | | |
| Groupers | | | 18,000 | $1,080 | | | | |
| Grunts | 13,000 | 260 | | | | | | |
| Hogfish | 1,000 | 30 | 3,000 | 90 | | | | |
| Muttonfish | 2,000 | 100 | | | | | | |
| Porgies | 4,000 | 160 | | | | | | |
| Sheepshead, salt-water | 1,000 | 30 | 1,000 | 30 | | | | |
| Snook or sergeantfish | | | | | 1,200 | 54 | | |
| Sunfish | 172,200 | 5,687 | | | | | | |
| Tripletail | 200 | 4 | | | | | | |
| Yellowtail | 3,400 | 276 | | | | | | |
| Sea crawfish or spiny lobster | | | 199,600 | 15,966 | | | | |
| Clams, hard, public | | | | | | | 705,600 | $67,550 |
| Oysters, market, public, spring | | | | | | | 68,500 | 2,604 |
| Scallops, bay | | | | | | | 112,100 | 8,723 |
| Turtles, soft-shell | 19,100 | 392 | | | 70,000 | 1,260 | | |
| Total | 856,500 | 29,714 | 221,600 | 17,166 | 145,100 | 5,546 | 886,200 | 78,877 |

## *Fisheries of Florida, 1938*—Continued

### CATCH: BY GEAR—Continued

| Species | Tongs | | Forks | | Grabs | | Coquina scoops | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Sea crawfish or spiny lobster | -------- | -------- | -------- | -------- | 27,700 | $2,216 | -------- | -------- |
| Clams: | | | | | | | | |
| Coquina | -------- | -------- | | | | | 16,000 | $300 |
| Hard, public | -------- | -------- | 2,900 | $322 | 6,300 | 945 | -------- | -------- |
| Oysters, market: | | | | | | | | |
| Public, spring | 253,800 | $18,734 | -------- | -------- | -------- | -------- | -------- | -------- |
| Public, fall | 546,100 | 41,966 | -------- | -------- | -------- | -------- | -------- | -------- |
| Private, spring | 38,700 | 2,567 | -------- | -------- | -------- | -------- | -------- | -------- |
| Private, fall | 51,900 | 3,207 | -------- | -------- | -------- | -------- | -------- | -------- |
| Total | 890,500 | 66,474 | 2,900 | 322 | 34,000 | 3,161 | 16,000 | 300 |

| Species | Hooks | | | | Diving outfits | | By hand | |
|---|---|---|---|---|---|---|---|---|
| | Sponge | | Stone crab | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs, stone | -------- | -------- | 3,600 | $1,260 | -------- | -------- | 5,800 | $1,160 |
| Sea crawfish or spiny lobster | -------- | -------- | 25,200 | 1,260 | -------- | -------- | -------- | -------- |
| Clams; hard, public | -------- | -------- | -------- | -------- | -------- | -------- | 32,200 | 3,327 |
| Conchs | 7,800 | $624 | -------- | -------- | -------- | -------- | -------- | -------- |
| Oysters, market: | | | | | | | | |
| Public, spring | -------- | -------- | -------- | -------- | -------- | -------- | 19,200 | 953 |
| Public, fall | -------- | -------- | -------- | -------- | -------- | -------- | 12,000 | 572 |
| Private, spring | -------- | -------- | -------- | -------- | -------- | -------- | 91,500 | 4,720 |
| Private, fall | -------- | -------- | -------- | -------- | -------- | -------- | 78,800 | 4,065 |
| Scallops, bay | -------- | -------- | -------- | -------- | -------- | -------- | 20,000 | 1,479 |
| Sponges: | | | | | | | | |
| Grass | 10,200 | 8,331 | -------- | -------- | 6,700 | $4,272 | -------- | -------- |
| Sheepswool | 95,300 | 195,842 | -------- | -------- | 376,900 | 801,496 | -------- | -------- |
| Wire | -------- | -------- | -------- | -------- | 7,900 | 6,514 | -------- | -------- |
| Yellow | 18,500 | 8,745 | -------- | -------- | 90,500 | 45,648 | -------- | -------- |
| Total | 131,800 | 213,542 | 28,800 | 2,520 | 482,000 | 857,930 | 259,500 | 16,276 |

### OPERATING UNITS: BY COUNTIES

| Item | Bay | Brevard | Broward | Charlotte | Citrus | Clay | Collier | Dade |
|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | 109 | -------- | -------- | -------- | -------- | -------- | 18 | -------- |
| On boats and shore: | | | | | | | | |
| Regular | 238 | 113 | 29 | 180 | 135 | 43 | 294 | 235 |
| Casual | 44 | 11 | 21 | 60 | 51 | 4 | 97 | 41 |
| Total | 391 | 124 | 50 | 240 | 186 | 47 | 409 | 276 |
| Vessels: | | | | | | | | |
| Motor | 15 | -------- | -------- | -------- | -------- | -------- | 6 | -------- |
| Net tonnage | 239 | -------- | -------- | -------- | -------- | -------- | 43 | -------- |
| Sail | 1 | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Net tonnage | 9 | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Total vessels | 16 | -------- | -------- | -------- | -------- | -------- | 6 | -------- |
| Total net tonnage | 248 | -------- | -------- | -------- | -------- | -------- | 43 | -------- |
| Boats: | | | | | | | | |
| Motor | 55 | 59 | 25 | 79 | 75 | 18 | 174 | 153 |
| Other | 44 | 100 | 5 | 120 | 162 | 29 | 191 | 83 |
| Accessory boats | -------- | -------- | -------- | -------- | -------- | -------- | 3 | -------- |
| Apparatus: | | | | | | | | |
| Haul seines, common | 14 | -------- | -------- | 12 | -------- | 8 | 5 | 2 |
| Length, yards | 5,700 | -------- | -------- | 7,000 | -------- | 4,950 | 1,900 | 800 |
| Gill nets, runaround | 29 | 91 | 6 | 86 | 144 | -------- | 194 | 87 |
| Square yards | 103,800 | 77,280 | 7,000 | 96,000 | 95,100 | -------- | 209,900 | 182,700 |
| Trammel nets | 3 | -------- | -------- | 12 | 38 | -------- | 43 | 30 |
| Square yards | 2,000 | -------- | -------- | 25,750 | 22,800 | -------- | 84,800 | 33.000 |

## *Fisheries of Florida, 1938*—Continued

### OPERATING UNITS: BY COUNTIES—Continued

| Item | Bay | Brevard | Broward | Charlotte | Citrus | Clay | Collier | Dade |
|---|---|---|---|---|---|---|---|---|
| Apparatus—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Lines: | | | | | | | | |
| Hand | 193 | 9 | 24 | 46 | 33 | | 150 | 71 |
| Hooks | 316 | 9 | 24 | 46 | 33 | | 150 | 71 |
| Trawl | | | | | | | 6 | |
| Hooks | | | | | | | 300 | |
| Troll | | | 6 | 18 | 3 | | 73 | 70 |
| Hooks | | | 6 | 18 | 3 | | 73 | 70 |
| Trot with baits or snoods | | 17 | | 12 | | | | |
| Baits or snoods | | 15, 100 | | 6, 000 | | | | |
| Trot with hooks | | | | | | 22 | | |
| Hooks | | | | | | 10, 500 | | |
| Dip nets: | | | | | | | | |
| Common | 15 | 7 | | | | | | 7 |
| Drop | 12 | | | | | | | |
| Cast nets | | | 2 | 31 | | | 9 | |
| Pots: | | | | | | | | |
| Crab | | 2, 310 | | | | 85 | | 230 |
| Fish | | | | | | | | 50 |
| Sea crawfish | | | 280 | | | | | 1, 770 |
| Spears | 14 | | | | | | | |
| Dredges: | | | | | | | | |
| Clam | | | | | | | 1 | |
| Scallop | 30 | | | | | | | |
| Yards at mouth | 30 | | | | | | | |
| Tongs, oyster | 43 | | | | 14 | | | |
| Grabs | | | | | | | | 13 |

| Item | Dixie | Duval | Escambia | Franklin | Glades | Gulf | Hendry | Hernando |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | 135 | 248 | 64 | | 56 | | |
| On boats and shore: | | | | | | | | |
| Regular | 59 | 368 | 91 | 379 | 42 | 43 | 13 | 6 |
| Casual | 24 | 62 | 23 | 42 | 16 | 6 | | |
| Total | 83 | 565 | 362 | 485 | 58 | 105 | 13 | 6 |
| Vessels, motor | | 29 | 27 | 15 | | 2 | | |
| Net tonnage | | 359 | 1, 584 | 97 | | 93 | | |
| Boats: | | | | | | | | |
| Motor | 39 | 169 | 51 | 148 | 8 | 10 | 5 | 2 |
| Other | 76 | 199 | 34 | 90 | 58 | 26 | 12 | 6 |
| Accessory boats | | 12 | | | | 6 | | |
| Apparatus: | | | | | | | | |
| Purse seines, menhaden | | 4 | | | | 2 | | |
| Length, yards | | 1, 100 | | | | 560 | | |
| Haul seines, common | | 12 | 2 | 13 | 8 | 3 | 2 | |
| Length, yards | | 6, 100 | 800 | 5, 700 | 6, 750 | 1, 900 | 1, 900 | |
| Gill nets: | | | | | | | | |
| Anchor | 7 | 3 | | | | | | |
| Square yards | 2, 100 | 6, 500 | | | | | | |
| Drift | 7 | 30 | | 20 | | | | |
| Square yards | 4, 200 | 69, 900 | | 6, 600 | | | | |
| Runaround | 41 | 52 | 12 | 53 | | 14 | | 6 |
| Square yards | 18, 880 | 36, 510 | 28, 800 | 43, 400 | | 11, 000 | | 3, 000 |
| Trammel nets | 59 | | 30 | 12 | | | | |
| Square yards | 27, 520 | | 24, 000 | 14, 400 | | | | |
| Lines: | | | | | | | | |
| Hand | 59 | 31 | 268 | 92 | | | | |
| Hooks | 59 | 31 | 536 | 141 | | | | |
| Trawl | | 12 | | | | | | |
| Hooks | | 600 | | | | | | |
| Troll | | 7 | 10 | | | | | |
| Hooks | | 7 | 10 | | | | | |
| Trot with baits or snoods | | 21 | | 21 | | | | |
| Baits or snoods | | 16, 650 | | 8, 300 | | | | |
| Trot with hooks | | 93 | | 17 | 9 | | 1 | |
| Hooks | | 30, 225 | | 2, 500 | 1, 800 | | 500 | |
| Dip nets, drop | | | 12 | | | | | |
| Cast nets | | 15 | | | | | | |
| Otter trawls, shrimp | | 74 | 21 | 77 | | 2 | | |
| Yards at mouth | | 1, 431 | 210 | 1, 262 | | 36 | | |
| Pots: | | | | | | | | |
| Crab | | 1, 720 | | | | | | |
| Fish | | | | 120 | 2, 310 | | 515 | |
| Spears | | | 3 | 29 | 16 | 6 | | |
| Dredges, oyster | | | | 10 | | | | |
| Yards at mouth | | | | 10 | | | | |
| Tongs, oyster | | 6 | 12 | 162 | | 24 | | |

### *Fisheries of Florida, 1938*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Hills-borough | Indian River | Lee | Levy | Mana-tee | Martin | Monroe | Nassau |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 55 | | | | | | 5 | 297 |
| On boats and shore: | | | | | | | | |
| Regular | 94 | 79 | 295 | 115 | 151 | 178 | 273 | 166 |
| Casual | 60 | 1 | 125 | 38 | 31 | 5 | 44 | 18 |
| Total | 209 | 80 | 420 | 153 | 182 | 183 | 322 | 481 |
| Vessels, motor | 8 | | | | | | 2 | 39 |
| Net tonnage | 80 | | | | | | 10 | 755 |
| Boats: | | | | | | | | |
| Motor | 50 | 41 | 208 | 82 | 67 | 77 | 76 | 51 |
| Other | 105 | 46 | 244 | 108 | 125 | 70 | 202 | 61 |
| Accessory boats | | | | | | | | 30 |
| Apparatus: | | | | | | | | |
| Purse seines, menhaden | | | | | | | | 13 |
| Length, yards | | | | | | | | 3,660 |
| Haul seines, common | 2 | | 7 | | 17 | 15 | | 2 |
| Length, yards | 900 | | 2,550 | | 7,350 | 14,500 | | 500 |
| Gill nets: | | | | | | | | |
| Anchor | | | | 2 | | | 6 | |
| Square yards | | | | 2,400 | | | 2,500 | |
| Drift | | | | | | | | 10 |
| Square yards | | | | | | | | 5,100 |
| Runaround | 76 | 52 | 244 | 87 | 100 | 43 | 39 | 4 |
| Square yards | 59,200 | 41,850 | 248,700 | 40,500 | 94,400 | 70,000 | 72,800 | 2,300 |
| Stake | | | | | | | | 2 |
| Square yards | | | | | | | | 2,000 |
| Trammel nets | 2 | | 40 | 94 | 6 | 4 | 10 | |
| Square yards | 2,500 | | 65,600 | 43,475 | 14,400 | 4,400 | 16,800 | |
| Lines: | | | | | | | | |
| Hand | 96 | 18 | 81 | 60 | 21 | 33 | 78 | 3 |
| Hooks | 168 | 18 | 81 | 60 | 31 | 33 | 86 | 3 |
| Trawl | | | | | 6 | 8 | 1 | |
| Hooks | | | | | 240 | 400 | 100 | |
| Troll | 4 | 2 | 47 | 77 | 22 | 27 | 68 | |
| Hooks | 4 | 2 | 47 | 77 | 22 | 27 | 68 | |
| Trot with baits or snoods | 15 | | 6 | | 2 | | | 25 |
| Baits or snoods | 13,900 | | 3,000 | | 2,000 | | | 5,200 |
| Pound nets | | | | 1 | | | | |
| Dip nets, common | 6 | | | | 3 | | 13 | |
| Cast nets | 20 | | 49 | | 10 | | | |
| Otter trawls, shrimp | | | | | | | | 70 |
| Yards at mouth | | | | | | | | 1,382 |
| Pots: | | | | | | | | |
| Crab | | 125 | | | 500 | | | |
| Fish | | | | | | | 10 | |
| Dredges, scallop | | | 12 | | | | | |
| Yards at mouth | | | 8 | | | | | |
| Tongs, oyster | 4 | 1 | 2 | 2 | 2 | | | |
| Forks | | | | | 4 | | | |
| Coquina scoops | | | 4 | | | | | |
| Hooks: | | | | | | | | |
| Sponge | | | | | | | 170 | |
| Stone crab | | | | | | | 6 | |

| Item | Oka-loosa | Okee-chobee | Palm Beach | Pasco | Pin-ellas | Put-nam | St. Johns | St. Lucie |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 32 | | | | 111 | | 144 | 2 |
| On boats and shore: | | | | | | | | |
| Regular | 190 | 32 | 292 | 73 | 902 | 124 | 54 | 157 |
| Casual | 8 | | 131 | | 188 | 8 | 13 | |
| Total | 230 | 32 | 423 | 73 | 1,201 | 132 | 211 | 159 |
| Vessels, motor | 4 | | | | 15 | | 61 | 1 |
| Net tonnage | 48 | | | | 163 | | 507 | 15 |
| Boats: | | | | | | | | |
| Motor | 35 | 21 | 174 | 16 | 182 | 49 | 13 | 84 |
| Other | 30 | 30 | 114 | 73 | 331 | 76 | 37 | 24 |
| Apparatus: | | | | | | | | |
| Haul seines, common | 14 | 6 | 3 | | 16 | 30 | 6 | |
| Length, yards | 6,350 | 5,400 | 2,500 | | 6,900 | 17,820 | 370 | |
| Gill nets: | | | | | | | | |
| Drfit | | | | | | 4 | | |
| Square yards | | | | | | 2,900 | | |

*Fisheries of Florida, 1938*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Okaloosa | Okeechobee | Palm Beach | Pasco | Pinellas | Putnam | St. Johns | St. Lucie |
|---|---|---|---|---|---|---|---|---|
| Apparatus—Continued. | | | | | | | | |
| Gill nets—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Runaround | 2 | | 59 | 73 | 194 | | | 63 |
| Square yards | 1,200 | | 141,600 | 36,500 | 221,925 | | | 154,015 |
| Stake | 2 | | | | | | | |
| Square yards | 1,600 | | | | | | | |
| Trammel nets | 26 | | | | 4 | | | |
| Square yards | 16,000 | | | | 5,800 | | | |
| Lines: | | | | | | | | |
| Hand | 63 | | 120 | | 190 | | 8 | 54 |
| Hooks | 126 | | 120 | | 227 | | 8 | 54 |
| Trawl | | | | | | | | 2 |
| Hooks | | | | | | | | 400 |
| Troll | | | 274 | | 151 | | | 24 |
| Hooks | | | 274 | | 151 | | | 24 |
| Trot with baits or snoods | | | | | | 14 | 10 | |
| Baits or snoods | | | | | | 5,900 | 3,700 | |
| Trot with hooks | | 17 | 3 | | | 29 | | |
| Hooks | | 10,700 | 980 | | | 12,650 | | |
| Pound nets | | | | | | 23 | | |
| Fyke nets | | | | | | 8 | | |
| Cast nets | | | 31 | | | | 4 | |
| Otter trawls, shrimp | | | | | | | 69 | |
| Yards at mouth | | | | | | | 1,658 | |
| Pots: | | | | | | | | |
| Crab | | | | | 180 | | 540 | |
| Eel | | | | | | 71 | | |
| Fish | | 1,590 | 515 | | | | | |
| Spears | 9 | | | | 39 | | 4 | |
| Dredges, scallop | | | | | 12 | | | |
| Yards at mouth | | | | | 12 | | | |
| Tongs, oyster | 4 | | | | 12 | | 1 | |
| Grabs | | | | | 8 | | | |
| Hooks, sponge | | | | | 118 | | | |
| Diving outfits | | | | | 72 | | | |

| Item | Santa Rosa | Sarasota | Seminole | Taylor | Volusia | Wakulla | Walton |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | | 7 | | |
| On boats and shore: | | | | | | | |
| Regular | 14 | 150 | 24 | 115 | 113 | 112 | 4 |
| Casual | 8 | 105 | 4 | 27 | 32 | 112 | 7 |
| Total | 22 | 255 | 28 | 142 | 152 | 224 | 11 |
| Vessels, motor | | | | | 2 | | |
| Net tonnage | | | | | 32 | | |
| Boats: | | | | | | | |
| Motor | 9 | 116 | 12 | 43 | 37 | 49 | |
| Other | 21 | 134 | 21 | 133 | 109 | 128 | 5 |
| Apparatus: | | | | | | | |
| Haul seines, common | | 10 | | | 17 | 12 | |
| Length, yards | | 3,300 | | | 9,525 | 2,850 | |
| Gill nets, runaround | | 107 | | 109 | 26 | 105 | |
| Square yards | | 113,800 | | 50,600 | 21,900 | 41,000 | |
| Trammel nets | 16 | 14 | | 86 | | 90 | 2 |
| Square yards | 6,400 | 33,600 | | 39,300 | | 36,000 | 1,200 |
| Lines: | | | | | | | |
| Hand | 9 | 56 | | 39 | 32 | 22 | |
| Hooks | 9 | 64 | | 39 | 32 | 22 | |
| Troll | | 106 | | 6 | | | |
| Hooks | | 106 | | 6 | | | |
| Trot with baits or snoods | | | | | 8 | | |
| Baits or snoods | | | | | 3,800 | | |
| Trot with hooks | | | 28 | | | | |
| Hooks | | | 6,300 | | | | |
| Dip nets, common | | | | | 6 | | |
| Cast nets | | 6 | | | 28 | | |
| Otter trawls, shrimp | | | | | 6 | | |
| Yards at mouth | | | | | 145 | | |
| Pots, crab | | | | | | 1,200 | |
| Spears | 6 | | | | 21 | 4 | 6 |
| Tongs, oyster | 10 | 4 | | | 14 | 11 | 3 |
| Forks | | 7 | | | | | |
| Hooks, stone crab | | 4 | | | | | |

## *Fisheries of Florida, 1938*—Continued

### CATCH: BY COUNTIES

| Species | Bay | | Brevard | | Broward | | Charlotte | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 362, 300 | $10, 869 | 600 | $24 | 14, 000 | $910 | 30, 400 | $839 |
| Blue runner or hardtail | 328, 600 | 3, 408 | ---- | ---- | ---- | ---- | 5, 200 | 104 |
| Cabio or crab eater | ---- | ---- | ---- | ---- | ---- | ---- | 700 | 14 |
| Cigarfish | 2, 000 | 40 | ---- | ---- | ---- | ---- | ---- | ---- |
| Crevalle | ---- | ---- | 20, 400 | 510 | ---- | ---- | ---- | ---- |
| Croaker | 300 | 9 | ---- | ---- | ---- | ---- | ---- | ---- |
| Drum: | | | | | | | | |
| Black | 1, 100 | 17 | 3, 800 | 110 | ---- | ---- | 900 | 18 |
| Red or redfish | 34, 200 | 1, 179 | 16, 800 | 560 | ---- | ---- | 126, 600 | 3, 800 |
| Flounders | 7, 100 | 395 | ---- | ---- | ---- | ---- | 6, 300 | 126 |
| Groupers | 1, 185, 500 | 36, 587 | ---- | ---- | 6, 200 | 315 | 18, 000 | 360 |
| Grunts | ---- | ---- | 7, 800 | 312 | ---- | ---- | ---- | ---- |
| Jewfish | ---- | ---- | ---- | ---- | 500 | 25 | 2, 000 | 40 |
| Kingfish or "king mackerel" | 13, 000 | 390 | ---- | ---- | 20, 000 | 1, 000 | 7, 400 | 246 |
| King whiting or "kingfish" | 1, 400 | 14 | 4, 000 | 61 | ---- | ---- | 3, 500 | 70 |
| Menhaden | 18, 000 | 360 | ---- | ---- | ---- | ---- | ---- | ---- |
| Mojarra | ---- | ---- | ---- | ---- | ---- | ---- | 90, 600 | 1, 812 |
| Mullet | 1, 123, 900 | 33, 717 | 1, 164, 700 | 35, 531 | 6, 000 | 180 | 1, 682, 700 | 57, 844 |
| Muttonfish | ---- | ---- | ---- | ---- | 1, 200 | 105 | ---- | ---- |
| Permit | ---- | ---- | ---- | ---- | ---- | ---- | 3, 000 | 60 |
| Pigfish | ---- | ---- | ---- | ---- | ---- | ---- | 2, 500 | 50 |
| Pinfish or sailors choice | ---- | ---- | 7, 400 | 111 | ---- | ---- | ---- | ---- |
| Pompano | 11, 700 | 1, 990 | 4, 700 | 1, 049 | 1, 300 | 302 | 26, 400 | 5, 280 |
| Porgies | 5, 000 | 150 | ---- | ---- | ---- | ---- | ---- | ---- |
| Sheepshead, salt-water | 3, 300 | 54 | 10, 600 | 178 | ---- | ---- | 49, 000 | 980 |
| Snapper: | | | | | | | | |
| Mangrove | ---- | ---- | ---- | ---- | 2, 000 | 114 | 46, 800 | 936 |
| Red | 1, 263, 400 | 90, 984 | ---- | ---- | 2, 000 | 135 | ---- | ---- |
| Snook or sergeantfish | ---- | ---- | 700 | 27 | ---- | ---- | 87, 400 | 1, 748 |
| Spadefish | 1, 300 | 20 | ---- | ---- | ---- | ---- | ---- | ---- |
| Spanish mackerel | 599, 100 | 23, 664 | ---- | ---- | 10, 000 | 480 | 212, 000 | 9, 914 |
| Spot | 2, 400 | 46 | 15, 700 | 288 | ---- | ---- | 4, 400 | 88 |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 134, 300 | 8, 547 | 129, 900 | 8, 370 | ---- | ---- | 245, 800 | 15, 936 |
| White | 2, 100 | 32 | ---- | ---- | ---- | ---- | 4, 100 | 234 |
| Tenpounder | 212, 000 | 4, 240 | ---- | ---- | ---- | ---- | ---- | ---- |
| Crabs: | | | | | | | | |
| Hard | 1, 800 | 70 | 773, 000 | 13, 190 | ---- | ---- | 213, 400 | 4, 268 |
| Stone | ---- | ---- | 12, 700 | 1, 763 | ---- | ---- | ---- | ---- |
| Sea crawfish or spiny lobster | ---- | ---- | ---- | ---- | 71, 400 | 5, 718 | ---- | ---- |
| Oysters, market: | | | | | | | | |
| Public, spring | 19, 400 | 1, 803 | ---- | ---- | ---- | ---- | ---- | ---- |
| Public, fall | 9, 200 | 950 | ---- | ---- | ---- | ---- | ---- | ---- |
| Scallops, bay | 60, 200 | 4, 275 | ---- | ---- | ---- | ---- | ---- | ---- |
| Total | 5, 402, 600 | 223, 810 | 2, 172, 800 | 62, 084 | 134, 600 | 9, 284 | 2, 869, 100 | 104, 767 |

| Species | Citrus | | Clay | | Collier | | Dade | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Amberjack | ---- | ---- | ---- | ---- | ---- | ---- | 4, 000 | $100 |
| Angelfish | ---- | ---- | ---- | ---- | ---- | ---- | 500 | 10 |
| Bluefish | 10, 000 | $700 | ---- | ---- | 42, 200 | $1, 688 | 49, 100 | 3, 445 |
| Blue runner or hardtail | ---- | ---- | ---- | ---- | ---- | ---- | 42, 000 | 1, 060 |
| Catfish and bullheads | 2, 000 | 80 | 303, 100 | $13, 641 | ---- | ---- | ---- | ---- |
| Crappie | ---- | ---- | 5, 600 | 225 | ---- | ---- | ---- | ---- |
| Crevalle | ---- | ---- | ---- | ---- | 2, 700 | 56 | 10, 800 | 270 |
| Dolphin | ---- | ---- | ---- | ---- | ---- | ---- | 2, 000 | 100 |
| Drum: | | | | | | | | |
| Black | ---- | ---- | ---- | ---- | 3, 800 | 78 | 2, 300 | 69 |
| Red or redfish | 116, 900 | 4, 091 | ---- | ---- | 116, 100 | 3, 647 | 2, 800 | 84 |
| Flounders | 3, 500 | 123 | ---- | ---- | 1, 700 | 46 | ---- | ---- |
| Groupers | 5, 200 | 182 | ---- | ---- | 71, 800 | 2, 154 | 147, 200 | 8, 832 |
| Grunts | ---- | ---- | ---- | ---- | ---- | ---- | 12, 500 | 250 |
| Hogfish | ---- | ---- | ---- | ---- | ---- | ---- | 10, 000 | 300 |
| Jewfish | ---- | ---- | ---- | ---- | 10, 800 | 324 | 11, 000 | 385 |
| Kingfish or "king mackerel" | ---- | ---- | ---- | ---- | 101, 000 | 3, 743 | 489, 000 | 24, 450 |
| King whiting or "kingfish" | ---- | ---- | ---- | ---- | 500 | 12 | ---- | ---- |
| Mojarra | ---- | ---- | ---- | ---- | 54, 600 | 1, 092 | 3, 700 | 111 |
| Mullet | 2, 123, 100 | 74, 308 | 800 | 17 | 3, 120, 700 | 96, 807 | 711, 000 | 24, 883 |
| Muttonfish | ---- | ---- | ---- | ---- | ---- | ---- | 140, 900 | 10, 568 |
| Permit | ---- | ---- | ---- | ---- | 8, 600 | 171 | 1, 500 | 45 |
| Pigfish | 800 | 28 | ---- | ---- | 300 | 6 | ---- | ---- |
| Pompano | ---- | ---- | ---- | ---- | 222, 800 | 44, 429 | 98, 100 | 23, 583 |
| Sharks | ---- | ---- | ---- | ---- | 290, 000 | 1, 900 | ---- | ---- |

## *Fisheries of Florida, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Citrus |  | Clay |  | Collier |  | Dade |  |
|---|---|---|---|---|---|---|---|---|
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Sheepshead, salt-water | 15, 500 | $542 |  |  | 130, 800 | $3, 050 | 29, 000 | $870 |
| Snapper, mangrove | 28, 600 | 1, 003 |  |  | 48, 500 | 1, 540 | 8, 800 | 475 |
| Snook or sergeantfish |  |  |  |  | 139, 200 | 4, 951 | 54, 000 | 2, 160 |
| Spadefish |  |  |  |  | 1, 000 | 20 |  |  |
| Spanish mackerel | 3, 800 | 136 |  |  | 583, 600 | 24, 331 | 583, 500 | 36, 875 |
| Spot |  |  |  |  | 800 | 20 |  |  |
| Squeteagues or "sea trout": |  |  |  |  |  |  |  |  |
| Spotted | 141, 200 | 9, 884 |  |  | 122, 800 | 7, 368 | 25, 000 | 1, 750 |
| White |  |  |  |  | 2, 000 | 80 |  |  |
| Sunfish |  |  | 46, 700 | $1, 868 |  |  |  |  |
| Tripletail |  |  |  |  |  |  | 1, 200 | 24 |
| Yellowtail |  |  |  |  |  |  | 61, 100 | 5, 634 |
| Crabs: |  |  |  |  |  |  |  |  |
| Hard |  |  | 1, 100 | 19 |  |  |  |  |
| Stone |  |  |  |  |  |  | 7, 500 | 2, 550 |
| Sea crawfish or spiny lobster |  |  |  |  |  |  | 162, 500 | 12, 992 |
| Clams, hard, public |  |  |  |  | 705, 600 | 67, 550 |  |  |
| Oysters, market: |  |  |  |  |  |  |  |  |
| Public, spring | 6, 600 | 347 |  |  |  |  |  |  |
| Public, fall | 10, 200 | 540 |  |  |  |  |  |  |
| Private, spring | 2, 600 | 135 |  |  |  |  |  |  |
| Private, fall | 6, 800 | 360 |  |  |  |  |  |  |
| Sponges: |  |  |  |  |  |  |  |  |
| Grass |  |  |  |  |  |  | 100 | 38 |
| Sheepswool |  |  |  |  |  |  | 800 | 1, 869 |
| Yellow |  |  |  |  |  |  | 100 | 40 |
| Total | 2, 476, 800 | 92, 459 | 357, 300 | 15, 770 | 5, 781, 900 | 265, 063 | 2, 672, 000 | 163, 822 |

| Species | Dixie |  | Duval |  | Escambia |  | Franklin |  |
|---|---|---|---|---|---|---|---|---|
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 12, 300 | $723 | 1, 600 | $80 | 40, 500 | $1, 114 | 18, 700 | $564 |
| Blue runner or hardtail |  |  |  |  | 34, 700 | 347 | 24, 300 | 486 |
| Cabio or crab eater |  |  | 100 | 5 |  |  |  |  |
| Catfish and bullheads | 4, 000 | 120 | 515, 400 | 20, 616 |  |  | 19, 800 | 888 |
| Crappie |  |  | 10, 100 | 606 |  |  |  |  |
| Crevalle | 1, 300 | 47 | 4, 400 | 86 |  |  |  |  |
| Croaker |  |  | 3, 400 | 67 |  |  |  |  |
| Drum: |  |  |  |  |  |  |  |  |
| Black |  |  | 4, 100 | 123 |  |  | 300 | 9 |
| Red or redfish | 54, 500 | 1, 907 | 20, 100 | 803 | 2, 400 | 72 | 23, 400 | 820 |
| Flounders | 4, 200 | 158 | 10, 800 | 449 | 12, 700 | 568 | 32, 800 | 1, 816 |
| Groupers | 200 | 7 | 600 | 18 | 972, 900 | 34, 053 | 500, 000 | 12, 558 |
| Grunts |  |  |  |  |  |  | 1, 700 | 51 |
| Hickory shad |  |  | 1, 300 | 39 |  |  |  |  |
| Jewfish |  |  | 14, 100 | 564 |  |  | 3, 000 | 90 |
| Kingfish or "king mackerel" |  |  |  |  | 2, 200 | 44 |  |  |
| King whiting or "kingfish" |  |  | 98, 000 | 1, 630 | 4, 500 | 90 | 2, 400 | 49 |
| Menhaden |  |  | 39, 041, 100 | 102, 881 | 60, 000 | 900 | 26, 900 | 538 |
| Mullet | 434, 600 | 15, 211 | 535, 900 | 20, 480 | 164, 500 | 4, 931 | 1, 029, 700 | 36, 013 |
| Pigfish | 600 | 24 |  |  |  |  |  |  |
| Pompano | 4, 200 | 756 | 2, 200 | 438 | 23, 800 | 4, 760 | 4, 600 | 872 |
| Porgies |  |  |  |  | 6, 700 | 214 |  |  |
| Sea catfish |  |  |  |  | 8, 200 | 164 | 55, 200 | 1, 104 |
| Shad |  |  | 80, 100 | 8, 214 |  |  |  |  |
| Sharks |  |  | 154, 600 | 1, 237 |  |  |  |  |
| Sheepshead, salt-water | 29, 700 | 1, 139 | 2, 500 | 100 | 5, 600 | 108 | 1, 700 | 61 |
| Snapper: |  |  |  |  |  |  |  |  |
| Mangrove | 1, 100 | 38 |  |  |  |  |  |  |
| Red |  |  | 12, 700 | 762 | 2, 313, 500 | 169, 401 | 431, 600 | 29, 991 |
| Spanish mackerel | 1, 100 | 43 | 3, 200 | 224 | 269, 600 | 15, 480 | 83, 300 | 3, 214 |
| Spot | 500 | 17 | 8, 400 | 168 | 3, 700 | 74 | 8, 700 | 276 |
| Squeteagues or "sea trout": |  |  |  |  |  |  |  |  |
| Spotted | 191, 500 | 11, 990 | 26, 200 | 2, 126 | 31, 400 | 2, 826 | 91, 200 | 5, 733 |
| White |  |  |  |  | 400 | 12 | 7, 700 | 220 |
| Sturgeon | 17, 000 | 1, 700 |  |  |  |  | 17, 000 | 1, 360 |
| Sunfish |  |  | 27, 700 | 1, 524 |  |  |  |  |
| Tenpounder |  |  |  |  | 75, 000 | 1, 125 | 14, 500 | 290 |
| Turbot |  |  | 1, 800 | 36 |  |  |  |  |
| Crabs, hard |  |  | 2, 894, 100 | 35, 792 | 3, 500 | 175 | 458, 000 | 4, 580 |
| Shrimp |  |  | 2, 281, 100 | 69, 306 | 357, 600 | 16, 090 | 918, 100 | 32, 075 |
| Oysters, market: |  |  |  |  |  |  |  |  |
| Public, spring |  |  | 10, 300 | 485 | 11, 900 | 1, 116 | 227, 900 | 12, 852 |
| Public, fall |  |  | 11, 100 | 444 | 4, 200 | 518 | 445, 400 | 32, 542 |
| Private, spring |  |  | 25, 500 | 1, 326 |  |  |  |  |
| Private, fall |  |  | 37, 600 | 2, 444 |  |  |  |  |
| Total | 756, 800 | 33, 880 | 45, 840, 100 | 273, 073 | 4, 409, 500 | 254, 182 | 4, 447, 900 | 179, 052 |

## *Fisheries of Florida, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Glades | | Gulf | | Hendry | | Hernando | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | | | 35,000 | $1,050 | | | 300 | $10 |
| Blue runner or hardtail | | | 3,800 | 38 | | | | |
| Catfish and bullheads | 366,100 | $11,898 | | | 12,200 | $417 | | |
| Crappie | 191,200 | 6,215 | | | 8,500 | 255 | | |
| Croaker | | | 900 | 27 | | | | |
| Drum: | | | | | | | | |
| Black | | | 600 | 18 | | | | |
| Red or redfish | | | 4,000 | 120 | | | 100 | 4 |
| Flounders | | | 2,100 | 124 | | | 100 | 4 |
| King whiting or "kingfish" | | | 500 | 12 | | | | |
| Menhaden | | | 202,500 | 480 | | | | |
| Mullet | | | 460,000 | 13,800 | | | 28,000 | 980 |
| Pompano | | | 6,400 | 1,152 | | | | |
| Sheepshead, salt-water | | | 400 | 12 | | | | |
| Snapper, mangrove | | | | | | | 100 | 4 |
| Spanish mackerel | | | 102,000 | 3,235 | | | | |
| Spot | | | 300 | 9 | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | | | 27,000 | 1,620 | | | 600 | 42 |
| White | | | 200 | 6 | | | | |
| Sunfish | 187,300 | 6,087 | | | 13,900 | 346 | | |
| Shrimp | | | 20,000 | 700 | | | | |
| Oysters, market: | | | | | | | | |
| Public, spring | | | 17,000 | 1,500 | | | | |
| Public, fall | | | 51,000 | 5,400 | | | | |
| Turtles, soft-shell | 116,000 | 2,087 | | | 3,800 | 76 | | |
| Total | 860,600 | 26,287 | 933,700 | 29,303 | 38,400 | 1,094 | 29,200 | 1,044 |

| Species | Hillsborough | | Indian River | | Lee | | Levy | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Angelfish | | | | | | | 500 | $18 |
| Bluefish | 3,800 | $155 | 89,300 | $4,465 | 22,200 | $1,332 | 21,400 | 1,681 |
| Blue runner or hardtail | 200 | 2 | | | 800 | 27 | 8,000 | 275 |
| Cabio or crab eater | | | | | 2,400 | 72 | | |
| Catfish and bullheads | | | | | | | 5,000 | 150 |
| Crevalle | 9,200 | 92 | 9,100 | 164 | 11,100 | 333 | 1,100 | 38 |
| Drum: | | | | | | | | |
| Black | 800 | 8 | 22,900 | 582 | 2,900 | 87 | | |
| Red or redfish | 9,200 | 330 | 30,000 | 900 | 163,900 | 4,917 | 54,600 | 1,761 |
| Flounders | 2,900 | 115 | | | 4,900 | 147 | 1,300 | 45 |
| Groupers | 401,700 | 10,040 | 2,600 | 125 | 17,600 | 528 | 8,200 | 240 |
| Jewfish | | | 2,000 | 50 | 8,300 | 249 | 3,000 | 75 |
| Kingfish or "king mackerel" | 2,000 | 60 | | | 15,900 | 557 | 181,500 | 4,548 |
| King whiting or "kingfish" | | | 800 | 12 | 5,100 | 153 | | |
| Mojarra | 16,700 | 224 | 16,000 | 240 | 92,000 | 2,760 | | |
| Mullet | 486,300 | 17,982 | 535,700 | 11,393 | 2,916,600 | 102,081 | 959,400 | 32,315 |
| Muttonfish | | | 2,000 | 140 | | | | |
| Permit | | | | | 1,100 | 33 | | |
| Pigfish | | | 16,500 | 250 | 2,000 | 60 | | |
| Pinfish or sailors choice | | | 14,800 | 165 | | | | |
| Pompano | 2,100 | 420 | 9,000 | 2,124 | 94,900 | 18,980 | 6,400 | 1,152 |
| Sea bass | | | 22,500 | 900 | | | | |
| Sheepshead, salt-water | 16,200 | 563 | 19,300 | 364 | 192,000 | 5,760 | 36,000 | 1,186 |
| Snapper: | | | | | | | | |
| Mangrove | 1,000 | 38 | 16,600 | 333 | 77,800 | 2,334 | 4,400 | 138 |
| Red | 593,700 | 38,588 | 2,800 | 168 | | | | |
| Snook or sergeantfish | 9,000 | 360 | 23,700 | 1,126 | 120,900 | 3,627 | | |
| Spanish mackerel | 7,600 | 304 | 97,600 | 4,557 | 288,400 | 11,536 | 13,800 | 481 |
| Spot | 15,500 | 425 | 43,800 | 657 | 7,000 | 210 | 500 | 17 |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 99,700 | 6,979 | 219,100 | 12,838 | 315,200 | 18,912 | 205,300 | 15,411 |
| White | 2,000 | 73 | | | 9,600 | 384 | | |
| Tenpounder | | | | | | | 3,000 | 105 |
| Crabs, hard | 262,500 | 3,835 | 28,800 | 547 | 112,000 | 2,240 | | |
| Clams, coquina | | | | | 16,000 | 300 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 1,000 | 150 | 400 | 8 | 600 | 100 | 100 | 10 |
| Public, fall | 400 | 55 | | | | | 500 | 50 |
| Private, spring | 2,700 | 540 | | | | | | |
| Private, fall | 300 | 60 | | | | | | |
| Scallops, bay | | | | | 28,000 | 2,667 | | |
| Turtles, green | | | | | | | 5,000 | 150 |
| Total | 1,946,500 | 81,398 | 1,225,300 | 42,108 | 4,529,200 | 180,386 | 1,519,000 | 59,846 |

### *Fisheries of Florida, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Manatee | | Martin | | Monroe | | Nassau | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Amberjack | | | 100 | $2 | 1,000 | $20 | | |
| Bluefish | 31,600 | $1,414 | 664,700 | 33,235 | 11,700 | 423 | 700 | $42 |
| Blue runner or hardtail | 300 | 3 | 200 | 5 | 1,800 | 36 | | |
| Cabio | 1,300 | 33 | | | | | | |
| Crevalle | 5,700 | 112 | 73,000 | 1,095 | | | | |
| Croaker | 800 | 20 | 4,000 | 59 | | | | |
| Drum: | | | | | | | | |
| Black | | | 7,700 | 231 | 1,500 | 45 | 400 | 9 |
| Red or redfish | 81,100 | 2,895 | 17,100 | 342 | 3,000 | 105 | 700 | 35 |
| Flounders | 5,800 | 126 | | | | | 15,800 | 808 |
| Groupers | 20,800 | 548 | 2,300 | 138 | 75,400 | 3,010 | | |
| Grunts | | | 3,000 | 60 | 19,500 | 390 | | |
| Hogfish | | | | | 5,800 | 290 | | |
| Jewfish | 2,000 | 50 | 2,400 | 72 | 40,700 | 1,812 | | |
| Kingfish or "king mackerel" | 7,900 | 237 | 2,700 | 122 | 262,300 | 10,432 | | |
| King whiting or "kingfish" | 600 | 6 | 5,700 | 86 | | | 17,000 | 300 |
| Menhaden | | | 32,000 | 320 | | | 109,842,100 | 281,671 |
| Mojarra | 19,700 | 492 | 6,500 | 130 | | | | |
| Mullet | 1,807,600 | 62,765 | 884,700 | 17,694 | 352,200 | 10,566 | 10,500 | 336 |
| Muttonfish | | | 5,300 | 106 | 79,500 | 3,900 | | |
| Pigfish | | | 20,000 | 200 | | | | |
| Pompano | 24,900 | 4,684 | 84,000 | 19,532 | 52,200 | 10,440 | | |
| Porgies | 3,200 | 68 | | | 18,500 | 740 | | |
| Shad | | | | | | | 12,300 | 1,883 |
| Sharks | 600,000 | 3,800 | 1,596,000 | 12,768 | 60,000 | 230 | | |
| Sheepshead, salt-water | 55,500 | 1,422 | 2,000 | 30 | 5,000 | 150 | 400 | 9 |
| Snapper: | | | | | | | | |
| Lane | | | | | 2,200 | 110 | | |
| Mangrove | 8,100 | 177 | 17,200 | 946 | 13,900 | 695 | | |
| Red | | | 2,800 | 196 | | | | |
| Snook or sergeantfish | 25,000 | 865 | 54,200 | 2,168 | 6,500 | 260 | | |
| Spadefish | 2,800 | 62 | | | | | | |
| Spanish mackerel | 222,300 | 9,232 | 131,600 | 6,580 | 422,200 | 16,888 | | |
| Spot | 9,400 | 115 | 12,500 | 250 | | | 500 | 7 |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 213,200 | 12,792 | 51,100 | 3,068 | 27,500 | 1,650 | 5,700 | 557 |
| White | 12,500 | 500 | | | | | | |
| Tripletail | | | 15,400 | 231 | | | | |
| Yellowtail | | | 100 | 6 | 103,800 | 8,293 | | |
| Crabs: | | | | | | | | |
| Hard | 53,000 | 707 | | | | | 200,000 | 3,000 |
| Stone | 7,500 | 1,875 | | | 5,800 | 1,160 | | |
| Sea crawfish or spiny lobster | | | | | 63,200 | 3,160 | | |
| Shrimp | | | | | | | 1,775,400 | 53,262 |
| Clams, hard, public | 1,600 | 192 | | | | | | |
| Conchs | | | | | 7,800 | 624 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 500 | 80 | | | | | 5,800 | 278 |
| Public, fall | | | | | | | 1,800 | 112 |
| Private, spring | | | | | | | 83,900 | 4,325 |
| Private, fall | | | | | | | 70,500 | 3,521 |
| Scallops, bay | 300 | 36 | | | | | | |
| Turtles: | | | | | | | | |
| Green | | | | | 3,200 | 160 | | |
| Loggerhead | | | | | 800 | 16 | | |
| Sponges: | | | | | | | | |
| Grass | | | | | 6,400 | 5,950 | | |
| Sheepswool | | | | | 48,500 | 97,858 | | |
| Yellow | | | | | 15,100 | 7,085 | | |
| Total | 3,225,000 | 105,308 | 3,698,300 | 99,672 | 1,717,000 | 186,498 | 112,043,500 | 350,159 |

| Species | Oskaloosa | | Okeechobee | | Palm Beach | | Pasco | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Amberjack | | | | | 2,300 | $58 | | |
| Angelfish | | | | | 200 | 4 | | |
| Barracuda | | | | | 500 | 20 | | |
| Bluefish | 85,400 | $2,562 | | | 919,500 | 36,866 | 6,000 | $420 |
| Blue runner or hardtail | 249,100 | 2,491 | | | 14,300 | 297 | | |
| Cabio or crab eater | | | | | 200 | 8 | | |
| Catfish and bullheads | | | 732,800 | $29,314 | 138,700 | 6,242 | | |
| Cigarfish | 7,000 | 140 | | | | | | |
| Crappie | | | 209,100 | 7,417 | 29,800 | 1,042 | | |

## *Fisheries of Florida, 1938*—Continued

### CATCH: By counties—Continued

| Species | Oskaloosa | | Okeechobee | | Palm Beach | | Pasco | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crevalle | | | | | 7,200 | $164 | | |
| Croaker | | | | | 1,600 | 32 | | |
| Dolphin | | | | | 600 | 23 | | |
| Drum, red or redfish | 1,800 | $50 | | | 3,000 | 124 | 7,300 | $256 |
| Flounders | 5,900 | 472 | | | | | 700 | 26 |
| Groupers | 383,500 | 11,505 | | | 35,700 | 1,218 | | |
| Grunts | | | | | 3,300 | 65 | | |
| Jewfish | | | | | 4,900 | 117 | | |
| Kingfish or "king mackerel" | 19,600 | 475 | | | 2,258,800 | 78,883 | | |
| King whiting or "kingfish" | | | | | 1,100 | 35 | | |
| Menhaden | 46,100 | 922 | | | 400 | 4 | | |
| Mojarra | | | | | 4,500 | 158 | | |
| Moonfish | | | | | 300 | 6 | | |
| Mullet | 902,000 | 24,830 | | | 29,700 | 948 | 561,900 | 19,666 |
| Muttonfish | | | | | 53,600 | 2,720 | | |
| Permit | | | | | 1,000 | 21 | | |
| Pompano | 7,700 | 1,540 | | | 15,200 | 2,961 | 300 | 54 |
| Porgies | 15,300 | 459 | | | | | 300 | 10 |
| Sea bass | | | | | 600 | 24 | | |
| Sea catfish | 4,300 | 65 | | | | | | |
| Sheepshead, salt-water | 2,300 | 57 | | | 4,600 | 148 | 5,400 | 19 |
| Snapper: | | | | | | | | |
| Mangrove | | | | | 1,800 | 80 | 2,500 | 87 |
| Red | 634,600 | 44,422 | | | 1,000 | 72 | | |
| Snook or sergeantfish | | | | | 7,700 | 327 | | |
| Spanish mackerel | 186,100 | 5.533 | | | 385,700 | 15,486 | 5,200 | 208 |
| Spot | 200 | 3 | | | 600 | 22 | | |
| Squeteagues or "sea trout," spotted | 21,900 | 1,533 | | | 2,900 | 205 | 18,100 | 1,267 |
| Sturgeon | 2,000 | 160 | | | | | | |
| Sunfish | | | 137,300 | $4,805 | 22,800 | 798 | | |
| Swellfish | | | | | 1,000 | 80 | | |
| Tenpounder | 54,700 | 1,094 | | | | | | |
| Tripletail | | | | | 800 | 15 | | |
| Yellowtail | | | | | 4,000 | 80 | | |
| Sea crawfish or spiny lobster | | | | | 31,200 | 1,500 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 800 | 80 | | | | | | |
| Public, fall | 200 | 24 | | | | | | |
| Turtles, soft-shell | | | 164,700 | 3,304 | 500 | 10 | | |
| Total | 2,630,500 | 98,417 | 1,243,900 | 44,840 | 3,991,600 | 150,863 | 607,700 | 22,188 |

| Species | Pinellas | | Putnam | | St. Johns | | St. Lucie | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 391,600 | $1,959 | | | | |
| Amberjack | 17,000 | $361 | | | | | | |
| Bluefish | 73,800 | 4,139 | | | 2,000 | $100 | 1,878,100 | $93,905 |
| Blue runner or hardtail | 700 | 21 | | | | | 8,700 | 218 |
| Cabio or crab eater | 500 | 10 | | | | | 2,200 | 56 |
| Catfish and bullheads | | | 1,618,000 | 50,069 | | | | |
| Crappie | | | 65,400 | 1,986 | | | | |
| Crevalle | | | | | | | 31,600 | 474 |
| Croaker | | | | | | | 2,000 | 40 |
| Drum: | | | | | | | | |
| Black | | | | | 5,000 | 150 | | |
| Red or redfish | 50,200 | 1,706 | 100 | 4 | 5,500 | 253 | 5,800 | 232 |
| Eels, common | | | 9,800 | 243 | | | | |
| Flounders | 7,300 | 395 | | | 10,100 | 369 | 3,100 | 63 |
| Groupers | 474,300 | 14,246 | | | 1,600 | 39 | 7,600 | 228 |
| Grunts | | | | | | | 3,500 | 140 |
| Hickory shad | | | 31,100 | 1,137 | | | | |
| Jewfish | | | | | | | 8,400 | 252 |
| Kingfish or "king mackerel" | 63,800 | 2,506 | | | | | 32,400 | 1,296 |
| King whiting or "kingfish" | 1,000 | 20 | | | 149,500 | 2,259 | 17.600 | 440 |
| Mojarra | 1,700 | 34 | | | | | 20,900 | 624 |
| Mullet | 2,624,400 | 88,322 | 2,100 | 73 | 10,500 | 265 | 262,500 | 7,876 |
| Muttonfish | | | | | | | 400 | 20 |
| Pigfish | 300 | 6 | | | | | 5,100 | 129 |
| Pompano | 16,300 | 3,256 | | | | | 21,200 | 4,241 |
| Porgies | 8,900 | 324 | | | | | | |
| Sea bass | | | | | 2,300 | 46 | | |
| Shad | | | 133,800 | 11,482 | | | | |
| Sharks | | | | | | | 400,000 | 2,400 |

## *Fisheries of Florida, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Pinellas | | Putnam | | St. Johns | | St. Lucie | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Sheepshead, salt-water | 54,700 | $1,885 | | | | | 23,600 | $355 |
| Snapper: | | | | | | | | |
| Mangrove | 6,000 | 228 | | | | | 3,400 | 153 |
| Red | 24,000 | 1,560 | | | 18,300 | $732 | 15,500 | 930 |
| Snook or sergeantfish | 67,500 | 3,013 | | | | | 3,800 | 152 |
| Spanish mackerel | 846,200 | 37,605 | | | | | 1,433,600 | 71,685 |
| Spot | 3,500 | 76 | | | | | 11,000 | 275 |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 515,000 | 32,456 | | | 11,700 | 1,013 | 35,200 | 2,467 |
| White | 8,000 | 415 | | | | | | |
| Sunfish | | | 258,900 | $6,930 | | | | |
| Tripletail | | | | | | | 700 | 21 |
| Crabs: | | | | | | | | |
| Hard | | | 248,700 | 3,109 | 170,000 | 2,550 | | |
| Stone | 9,600 | 2,220 | | | | | | |
| Sea crawfish or spiny lobster | | | | | | | 100 | 7 |
| Shrimp | | | | | 4,423,800 | 132,464 | | |
| Clams, hard, public | 8,400 | 1,260 | | | 30,100 | 3,012 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 7,200 | 648 | | | 3,600 | 173 | | |
| Public, fall | | | | | 2,100 | 101 | | |
| Private, spring | 3,600 | 324 | | | 800 | 38 | | |
| Private, fall | 1,900 | 171 | | | 800 | 41 | | |
| Scallops, bay | 47,600 | 3,495 | | | | | | |
| Turtles, soft-shell | | | 3,100 | 64 | | | | |
| Sponges: | | | | | | | | |
| Grass | 10,400 | 6,615 | | | | | | |
| Sheepswool | 422,900 | 897,611 | | | | | | |
| Wire | 7,900 | 6,514 | | | | | | |
| Yellow | 93,800 | 47,268 | | | | | | |
| Total | 5,478,400 | 1,158,710 | 2,762,600 | 77,056 | 4,847,700 | 143,605 | 4,238,000 | 188,679 |

| Species | Santa Rosa | | Sarasota | | Seminole | | Taylor | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | | | 26,200 | $1,048 | | | 9,700 | $636 |
| Blue runner or hardtail | | | 4,200 | 84 | | | 1,600 | 50 |
| Catfish and bullheads | | | | | 206,700 | $8,767 | 1,000 | 30 |
| Crevalle | | | | | | | 1,800 | 57 |
| Drum, red or redfish | 1,500 | $75 | 27,200 | 544 | | | 47,900 | 1,564 |
| Flounders | 800 | 32 | 4,300 | 86 | | | 9,300 | 296 |
| Groupers | | | 27,300 | 516 | | | 1,100 | 35 |
| Jewfish | | | 500 | 10 | | | | |
| Kingfish or "king mackerel" | | | 177,700 | 7,108 | | | 8,000 | 280 |
| Mojarra | | | 6,600 | 132 | | | | |
| Mullet | 67,400 | 2,020 | 1,180,400 | 41,302 | | | 831,000 | 26,440 |
| Permit | | | 500 | 10 | | | | |
| Pigfish | | | 1,100 | 22 | | | | |
| Pompano | | | 21,300 | 4,260 | | | 7,600 | 1,468 |
| Sheepshead, salt-water | 400 | 8 | 46,700 | 934 | | | 7,300 | 232 |
| Snapper, mangrove | | | 5,900 | 118 | | | 1,100 | 36 |
| Snook or sergeantfish | | | 10,500 | 210 | | | | |
| Spanish mackerel | | | 319,200 | 15,960 | | | 16,200 | 531 |
| Spot | 100 | 2 | 5,900 | 118 | | | 2,700 | 85 |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 5,500 | 440 | 93,300 | 5,598 | | | 267,400 | 17,144 |
| White | 100 | 4 | 5,700 | 228 | | | | |
| Crabs, stone | | | 3,600 | 1,260 | | | | |
| Clams, hard, public | | | 1,300 | 130 | | | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 5,900 | 582 | 6,800 | 980 | | | | |
| Public, fall | 2,200 | 266 | 700 | 100 | | | | |
| Scallops, bay | | | 1,300 | 120 | | | | |
| Total | 83,900 | 3,429 | 1,978,200 | 80,908 | 206,700 | 8,767 | 1,216,700 | 48,884 |

## *Fisheries of Florida, 1938*—Continued

### CATCH: By counties—Continued

| Species | Volusia | | Wakulla | | Walton | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 8,300 | $385 | 8,600 | $492 | | |
| Blue runner or hardtail | | | 3,200 | 128 | | |
| Catfish and bullheads | 132,700 | 5,307 | | | | |
| Crappie | 33,000 | 1,306 | | | | |
| Crevalle | 1,100 | 18 | | | | |
| Drum: | | | | | | |
| Black | 5,600 | 128 | | | | |
| Red or redfish | 7,700 | 236 | 86,400 | 3,456 | 100 | $3 |
| Flounders | 28,000 | 1,574 | 7,200 | 288 | 1,300 | 118 |
| Groupers | 24,000 | 725 | 5,000 | 175 | | |
| Jewfish | 14,800 | 444 | | | | |
| King whiting or "kingfish" | 17,600 | 276 | | | | |
| Mullet | 298,300 | 10,256 | 1,236,100 | 47,818 | 46,000 | 1,610 |
| Pinfish or sailors choice | 1,500 | 23 | | | | |
| Pompano | 8,000 | 1,764 | 800 | 144 | | |
| Shad | 2,500 | 200 | | | | |
| Sheepshead, salt-water | 1,500 | 24 | 28,400 | 1,136 | 100 | 3 |
| Snapper, red | 62,000 | 492 | | | | |
| Spanish mackerel | | | 8,500 | 340 | | |
| Spot | 7,600 | 113 | 63,300 | 2,532 | | |
| Squeteagues or "sea trout," spotted | 43,600 | 3,068 | 94,100 | 6,150 | 800 | 56 |
| Sunfish | 173,200 | 8,660 | | | | |
| Crabs: | | | | | | |
| Hard | 175,000 | 2,188 | | | | |
| Stone | | | 7,800 | 1,170 | | |
| Shrimp | 366,600 | 14,715 | | | | |
| Oysters, market: | | | | | | |
| Public, spring | 11,200 | 585 | 4,300 | 490 | 200 | 24 |
| Public, fall | 13,500 | 705 | 5,500 | 717 | 100 | 14 |
| Private, spring | 11,100 | 599 | | | | |
| Private, fall | 12,800 | 671 | | | | |
| Turtles, soft-shell | 900 | 63 | | | | |
| Total | 1,462,100 | 54,525 | 1,559,200 | 65,036 | 48,600 | 1,828 |

### CATCH: By Districts

| Species | East Coast | | West Coast | | Lake Okeechobee | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 391,600 | $1,959 | | | | |
| Amberjack | 6,400 | 160 | 18,000 | $381 | | |
| Angelfish | 700 | 14 | 500 | 18 | | |
| Barracuda | 500 | 20 | | | | |
| Bluefish | 3,627,900 | 173,457 | 852,100 | 31,859 | | |
| Blue runner or hardtail | 65,200 | 1,580 | 666,500 | 7,500 | | |
| Cabio or crab eater | 2,500 | 69 | 4,900 | 129 | | |
| Catfish and bullheads | 2,775,900 | 98,400 | 31,800 | 1,268 | 1,249,800 | $47,871 |
| Cigarfish | | | 9,000 | 180 | | |
| Crappie | 114,100 | 4,123 | | | 438,600 | 14,929 |
| Crevalle | 157,600 | 2,781 | 32,900 | 735 | | |
| Croaker | 11,000 | 198 | 2,000 | 56 | | |
| Dolphin | 2,600 | 123 | | | | |
| Drum: | | | | | | |
| Black | 51,800 | 1,402 | 11,900 | 280 | | |
| Red or redfish | 109,600 | 3,573 | 1,012,400 | 33,302 | | |
| Eels, common | 9,800 | 243 | | | | |
| Flounders | 67,800 | 3,263 | 122,200 | 5,506 | | |
| Groupers | 227,800 | 11,638 | 4,168,500 | 126,774 | | |
| Grunts | 30,100 | 827 | 21,200 | 441 | | |
| Hickory shad | 32,400 | 1,176 | | | | |
| Hogfish | 10,000 | 300 | 5,800 | 290 | | |
| Jewfish | 58,100 | 1,909 | 70,300 | 2,650 | | |
| Kingfish or "king mackerel" | 2,802,900 | 105,751 | 862,300 | 30,626 | | |
| King whiting or "kingfish" | 311,300 | 5,099 | 19,500 | 426 | | |
| Menhaden | 148,915,600 | 384,876 | 353,500 | 3,200 | | |
| Mojarra | 51,600 | 1,263 | 281,900 | 6,546 | | |
| Moonfish | 300 | 6 | | | | |
| Mullet | 4,452,400 | 129,932 | 21,141,500 | 811,328 | | |
| Muttonfish | 203,400 | 13,659 | 79,500 | 3,900 | | |
| Permit | 2,700 | 66 | 13,200 | 274 | | |
| Pigfish | 41,600 | 579 | 7,600 | 196 | | |
| Pinfish or sailors choice | 23,700 | 299 | | | | |

## *Fisheries of Florida, 1938*—Continued

### CATCH: BY DISTRICTS—Continued

| Species | East Coast | | West Coast | | Lake Okeechobee | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Pompano | 243,700 | $55,994 | 534,400 | $105,637 | | |
| Porgies | | | 57,900 | 1,965 | | |
| Sea bass | 25,400 | 970 | | | | |
| Sea catfish | | | 67,700 | 1,333 | | |
| Shad | 228,700 | 21,779 | | | | |
| Sharks | 2,150,000 | 16,405 | 950,000 | 5,930 | | |
| Sheepshead, salt-water | 93,500 | 2,078 | 686,000 | 19,476 | | |
| Snapper: | | | | | | |
| Lane | | | 2,200 | 110 | | |
| Mangrove | 49,800 | 2,101 | 245,800 | 7,372 | | |
| Red | 117,100 | 3,487 | 5,260,800 | 374,946 | | |
| Snook or sergeantfish | 144,100 | 5,960 | 466,000 | 15,034 | | |
| Spadefish | | | 5,100 | 102 | | |
| Spanish mackerel | 2,645,200 | 135,887 | 4,190,200 | 178,635 | | |
| Spot | 100,100 | 1,780 | 128,900 | 4,113 | | |
| Squeteagues or "sea trout": | | | | | | |
| Spotted | 550,400 | 35,462 | 2,862,800 | 184,334 | | |
| White | | | 54,400 | 2,188 | | |
| Sturgeon | | | 36,000 | 3,220 | | |
| Sunfish | 506,500 | 18,982 | | | 361,300 | $12,036 |
| Swellfish | 1,000 | 80 | | | | |
| Tenpounder | | | 359,200 | 6,854 | | |
| Tripletail | 18,100 | 291 | | | | |
| Turbot | 1,800 | 36 | | | | |
| Yellowtail | 65,200 | 5,720 | 103,800 | 8,293 | | |
| Crabs: | | | | | | |
| Hard | 4,490,700 | 60,395 | 1,104,200 | 15,875 | | |
| Stone | 20,200 | 4,313 | 34,300 | 7,685 | | |
| Sea crawfish or spiny lobster | 265,200 | 20,217 | 63,200 | 3,160 | | |
| Shrimp | 8,846,900 | 269,747 | 1,295,700 | 48,865 | | |
| Clams: | | | | | | |
| Coquina | | | 16,000 | 300 | | |
| Hard, public | 30,100 | 3,012 | 716,900 | 69,132 | | |
| Conchs | | | 7,800 | 624 | | |
| Oysters, market: | | | | | | |
| Public, spring | 31,300 | 1,529 | 310,200 | 20,762 | | |
| Public, fall | 28,500 | 1,362 | 529,600 | 41,176 | | |
| Private, spring | 121,300 | 6,288 | 8,900 | 999 | | |
| Private, fall | 121,700 | 6,681 | 9,000 | 591 | | |
| Scallops, bay | | | 137,400 | 10,593 | | |
| Turtles: | | | | | | |
| Green | | | 8,200 | 310 | | |
| Loggerhead | | | 800 | 16 | | |
| Soft-shell | 4,000 | 127 | | | 285,000 | 5,477 |
| Sponges: | | | | | | |
| Grass | 100 | 38 | 16,800 | 12,565 | | |
| Sheepswool | 800 | 1,869 | 471,400 | 995,469 | | |
| Wire | | | 7,900 | 6,514 | | |
| Yellow | 100 | 40 | 108,900 | 54,353 | | |
| Total | 185,460,800 | 1,631,375 | 53,647,400 | 3,276,396 | 2,334,700 | 80,313 |

## *Sponge fishery of Florida, 1938*

### OPERATING UNITS: BY GEAR

| Item | Sponge hooks | Diving outfits | Total |
|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* |
| On vessels | | 96 | 96 |
| On boats and shore, regular | 410 | 413 | 823 |
| Total | 410 | 509 | 919 |
| Vessels, motor | | 13 | 13 |
| Net tonnage | | 135 | 135 |
| Boats: | | | |
| Motor | | 59 | 59 |
| Other | 290 | | 290 |
| Apparatus, number | 292 | 72 | |

*Sponge fishery of Florida, 1938*—Continued

CATCH: BY GEAR

| Sponges | Sponge hooks |  | Diving outfits |  | Total |  |
|---|---|---|---|---|---|---|
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Grass | 10, 200 | $8, 331 | 6, 700 | $4, 272 | 16, 900 | $12, 603 |
| Sheepswool | 95, 300 | 195, 842 | 376, 900 | 801, 496 | 472, 200 | 997, 338 |
| Wire | ---------- | ---------- | 7, 900 | 6, 514 | 7, 900 | 6, 514 |
| Yellow | 18, 500 | 8, 745 | 90, 500 | 45, 648 | 109, 000 | 54, 393 |
| Total | 124, 000 | 212, 918 | 482, 000 | 857, 930 | 606, 000 | 1, 070, 848 |

## SPONGES SOLD ON THE EXCHANGE, TARPON SPRINGS, FLA.

During 1938 sponges sold on the exchange at Tarpon Springs, Fla., amounted to 530,183 pounds, valued at $952,258. This is a decrease of 6 percent in quantity and of 13 percent in value as compared with the transactions during 1937. Of the total sponges sold on the exchange during 1938, 27,860 pounds, valued at $78,667, were large wool; 29,660 pounds, valued at $63,418, were medium and small wool; 363,118 pounds, valued at $751,176, were wool rags; 92,146 pounds, valued at $46,460, were yellow; 9,755 pounds, valued at $6,229, were grass; and 7,644 pounds, valued at $6,308, were wire. It is estimated that sponges valued at $2,750 were sold outside of the exchange.

## ALABAMA

*Fisheries of Alabama, 1938*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Gill nets, stake | Trammel nets | Lines |  |  | Fyke nets |
|---|---|---|---|---|---|---|---|
|  |  |  |  | Hand | Trot with baits or snoods | Trot with hooks |  |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 5 | ---------- | 9 | 80 | ---------- | ---------- | ---------- |
| On boats and shore: |  |  |  |  |  |  |  |
| Regular | 24 | 2 | 145 | 29 | 83 | 28 | 9 |
| Casual | 6 | ---------- | 13 | 7 | 12 | 13 | 1 |
| Total | 35 | 2 | 167 | 116 | 95 | 41 | 10 |
| Vessels, motor | 1 | ---------- | 3 | 11 | ---------- | ---------- | ---------- |
| Net tonnage | 17 | ---------- | 27 | 200 | ---------- | ---------- | ---------- |
| Boats: |  |  |  |  |  |  |  |
| Motor | 5 | 1 | 55 | 13 | 52 | 4 | 4 |
| Other | 5 | ---------- | 157 | 10 | 35 | 37 | 6 |
| Accessory boats | 1 | ---------- | 9 | ---------- | ---------- | ---------- | ---------- |
| Apparatus: |  |  |  |  |  |  |  |
| Number | 6 | 10 | 167 | 116 | 87 | 77 | 130 |
| Length, yards | 3, 600 | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- |
| Square yards | ---------- | 2, 000 | 87, 160 | ---------- | ---------- | ---------- | ---------- |
| Hooks, baits, or snoods | ---------- | ---------- | ---------- | 202 | 46, 650 | 23, 100 | ---------- |

## *Fisheries of Alabama, 1938*—Continued

### OPERATING UNITS: BY GEAR—Continued

| Item | Otter trawls, shrimp | Pots, fish | Spears | Dredges, oyster | Tongs, oyster | By hand, other than for oysters | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 47 |  |  | 46 | 88 |  | 235 |
| On boat and shore: |  |  |  |  |  |  |  |
| Regular | 269 | 15 | 38 | 28 | 276 | 4 | 652 |
| Casual |  | 23 | 21 |  | 157 | 3 | 253 |
| Total | 316 | 38 | 59 | 74 | 521 | 7 | 1,140 |
| Vessels, motor | 23 |  |  | 14 | 13 |  | 47 |
| Net tonnage | 206 |  |  | 132 | 110 |  | 527 |
| Boats: |  |  |  |  |  |  |  |
| Motor | 126 | 3 |  | 13 | 104 |  | 252 |
| Other |  | 35 |  |  | 167 |  | 415 |
| Accessory boats |  |  |  |  |  |  | 10 |
| Apparatus: |  |  |  |  |  |  |  |
| Number | 149 | 380 | 59 | 37 | 521 |  |  |
| Yards at mouth | 2,089 |  |  | 38 |  |  |  |

### CATCH: BY GEAR

| Species | Haul seines |  | Gill nets, stake |  | Trammel nets |  | Lines, hand |  |
|---|---|---|---|---|---|---|---|---|
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 8,200 | $396 |  |  | 13,000 | $679 |  |  |
| Blue runner or hardtail | 6,800 | 137 |  |  | 10,900 | 219 |  |  |
| Buffalofish |  |  |  |  | 10,200 | 409 |  |  |
| Catfish and bullheads |  |  |  |  | 900 | 63 |  |  |
| Croaker | 9,400 | 188 |  |  | 43,700 | 878 |  |  |
| Drum: |  |  |  |  |  |  |  |  |
| Black | 1,100 | 42 |  |  | 3,900 | 179 |  |  |
| Red or redfish | 9,200 | 462 |  |  | 20,000 | 1,005 | 2,600 | $125 |
| Flounders | 6,500 | 635 |  |  | 34,000 | 3,205 |  |  |
| Groupers |  |  |  |  |  |  | 222,300 | 6,812 |
| King whiting or "kingfish" |  |  |  |  | 300 | 15 |  |  |
| Mullet | 818,800 | 21,721 |  |  | 2,545,700 | 69,994 |  |  |
| Pompano | 100 | 16 |  |  | 1,400 | 280 |  |  |
| Sea catfish |  |  |  |  | 9,200 | 215 |  |  |
| Sheepshead, salt-water | 15,500 | 710 |  |  | 43,100 | 2,083 | 100 | 5 |
| Snapper, red |  |  |  |  |  |  | 1,193,100 | 85,388 |
| Spanish mackerel | 23,700 | 1,871 |  |  | 15,300 | 1,200 |  |  |
| Spot | 300 | 6 |  |  | 3,200 | 64 |  |  |
| Squeteagues or "sea trout": |  |  |  |  |  |  |  |  |
| Spotted | 21,800 | 2,104 |  |  | 81,100 | 7,956 | 16,500 | 1,610 |
| White | 200 | 1 |  |  | 4,200 | 109 | 700 | 19 |
| Sturgeon |  |  | 1,700 | $136 |  |  |  |  |
| Tenpounder | 6,700 | 133 |  |  | 3,900 | 78 |  |  |
| Total | 928,300 | 28,425 | 1,700 | 136 | 2,844,000 | 88,631 | 1,435,300 | 93,959 |

| Species | Lines—Continued |  |  |  | Fyke nets |  | Otter trawls |  |
|---|---|---|---|---|---|---|---|---|
|  | Trot with baits or snoods |  | Trot with hooks |  |  |  |  |  |
|  | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Buffalofish |  |  | 3,500 | $140 | 46,200 | $1,848 |  |  |
| Catfish and bullheads |  |  | 34,800 | 2,436 | 4,300 | 301 |  |  |
| Paddlefish or spoonbill cat |  |  | 40,100 | 3,558 |  |  |  |  |
| Sea catfish |  |  | 1,000 | 30 |  |  |  |  |
| Sheepshead, fresh-water |  |  |  |  | 4,700 | 235 |  |  |
| Sturgeon |  |  | 600 | 45 |  |  |  |  |
| Crabs, hard | 510,700 | $7,630 |  |  |  |  |  |  |
| Shrimp |  |  |  |  |  |  | 3,643,500 | $145,740 |
| Total | 510,700 | 7,630 | 80,000 | 6,209 | 55,200 | 2,384 | 3,643,500 | 145,740 |

## *Fisheries of Alabama, 1938*—Continued

### CATCH: By gear—Continued

| Species | Pots | | Spears | | Dredges | | Tongs | | By hand | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Catfish and bullheads | 33,600 | $2,352 | | | | | | | | |
| Flounders | | | 24,100 | $2,140 | | | | | | |
| Oysters, market: | | | | | | | | | | |
| Public, spring | | | | | | | 473,300 | $23,637 | | |
| Public, fall | | | | | 610,900 | $29,737 | 177,800 | 12,075 | | |
| Private, spring | | | | | | | 55,600 | 3,340 | | |
| Private, fall | | | | | | | 41,100 | 2,992 | | |
| Terrapin, diamond-back | | | | | | | | | 2,200 | $220 |
| Total | 33,600 | 2,352 | 24,100 | 2,140 | 610,900 | 29,737 | 747,800 | 42,044 | 2,200 | 220 |

### OPERATING UNITS: By counties

| Item | Baldwin | Mobile |
|---|---|---|
| Fishermen: | *Number* | *Number* |
| On vessels | 27 | 208 |
| On boats and shore: | | |
| Regular | 95 | 557 |
| Casual | 36 | 217 |
| Total | 158 | 982 |
| Vessels, motor | 5 | 42 |
| Net tonnage | 42 | 485 |
| Boats: | | |
| Motor | 26 | 226 |
| Other | 92 | 323 |
| Accessory boats | | 10 |
| Apparatus: | | |
| Haul seines | 2 | 4 |
| Length, yards | 1,200 | 2,400 |
| Gill nets, stake | 10 | |
| Square yards | 2,000 | |
| Trammel nets | 49 | 118 |
| Square yards | 24,500 | 62,660 |
| Lines: | | |
| Hand | 11 | 105 |
| Hooks | 16 | 186 |
| Trot with baits or snoods | | 87 |
| Baits or snoods | | 46,650 |
| Trot with hooks | 48 | 29 |
| Hooks | 14,400 | 8,700 |
| Fyke nets | 25 | 105 |
| Otter trawls, shrimp | 6 | 143 |
| Yards at mouth | 82 | 2,007 |
| Pots, fish | 100 | 280 |
| Spears | 26 | 33 |
| Dredges, oyster | 5 | 32 |
| Yards at mouth | 5 | 33 |
| Tongs, oyster | 67 | 454 |

### CATCH: By counties

| Species | Baldwin | | Mobile | |
|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 3,200 | $160 | 18,000 | $915 |
| Blue runner or hardtail | 700 | 14 | 17,000 | 342 |
| Buffalofish | 14,300 | 572 | 45,600 | 1,825 |
| Catfish and bullheads | 15,600 | 1,092 | 58,000 | 4,060 |
| Croaker | 18,500 | 370 | 34,600 | 696 |
| Drum: | | | | |
| Black | 500 | 25 | 4,500 | 196 |
| Red or redfish | 6,700 | 335 | 25,100 | 1,257 |
| Flounders | 18,100 | 1,479 | 46,500 | 4,501 |
| Groupers | 12,000 | 290 | 210,300 | 6,522 |
| King whiting or "kingfish" | 100 | 5 | 200 | 10 |
| Mullet | 789,100 | 20,523 | 2,575,400 | 71,192 |
| Paddlefish or spoonbill cat | 9,000 | 900 | 31,100 | 2,658 |
| Pompano | 100 | 20 | 1,400 | 276 |
| Sea catfish | 1,500 | 30 | 8,700 | 215 |

*Fisheries of Alabama, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Baldwin |  | Mobile |  |
|---|---|---|---|---|
|  | *Pounds* | *Value* | *Pounds* | *Value* |
| Sheepshead: |  |  |  |  |
| Fresh-water | 1,000 | $50 | 3,700 | $185 |
| Salt-water | 5,800 | 290 | 52,900 | 2,508 |
| Snapper, red | 15,000 | 1,069 | 1,178,100 | 84,319 |
| Spanish mackerel | 9,900 | 792 | 29,100 | 2,279 |
| Spot | 300 | 6 | 3,200 | 64 |
| Squeteagues or "sea trout": |  |  |  |  |
| Spotted | 24,500 | 2,246 | 94,900 | 9,424 |
| White | 1,400 | 42 | 3,700 | 90 |
| Sturgeon | 2,000 | 157 | 300 | 24 |
| Tenpounder | 2,900 | 58 | 7,700 | 153 |
| Crabs, hard |  |  | 510,700 | 7,630 |
| Shrimp | 99,400 | 3,976 | 3,544,100 | 141,764 |
| Oysters, market: |  |  |  |  |
| Public, spring | 27,300 | 1,496 | 446,000 | 22,141 |
| Public, fall | 69,500 | 4,612 | 719,200 | 37,200 |
| Private, spring | 31,000 | 1,800 | 24,600 | 1,540 |
| Private, fall | 27,500 | 2,000 | 13,600 | 992 |
| Terrapin, diamond-back | 300 | 30 | 1,900 | 190 |
| Total | 1,207,200 | 44,439 | 9,710,100 | 405,168 |

## MISSISSIPPI

*Fisheries of Mississippi, 1938*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Trammel nets | Lines |  |  | Dip nets, drop |
|---|---|---|---|---|---|---|
|  |  |  | Hand | Troll | Trot with baits or snoods |  |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 40 |  | 10 |  |  |  |
| On boats and shore: |  |  |  |  |  |  |
| Regular | 8 | 78 | 53 | 4 | 110 |  |
| Casual |  |  | 41 |  |  | 8 |
| Total | 48 | 78 | 104 | 4 | 110 | 8 |
| Vessels, motor | 5 |  | 2 |  |  |  |
| Net tonnage | 92 |  | 15 |  |  |  |
| Boats: |  |  |  |  |  |  |
| Motor | 1 | 31 | 23 | 2 | 59 |  |
| Other |  | 58 | 49 |  | 47 |  |
| Apparatus: |  |  |  |  |  |  |
| Number | 6 | 60 | 108 | 4 | 106 | 58 |
| Length, yards | 2,400 |  |  |  |  |  |
| Square yards |  | 31,500 |  |  |  |  |
| Hooks, baits, or snoods |  |  | 128 | 4 | 88,500 |  |

| Item | Cast nets | Otter trawls, shrimp | Spears | Dredges, oyster | Tongs, oyster | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels |  | 468 |  | 759 | 5 | 980 |
| On boats and shore: |  |  |  |  |  |  |
| Regular | 4 | 849 | 23 | 121 | 604 | 1,536 |
| Casual | 14 |  | 36 |  | 30 | 129 |
| Total | 18 | 1,317 | 59 | 880 | 639 | 2,645 |
| Vessels: |  |  |  |  |  |  |
| Motor |  | 192 |  | 149 | 1 | 240 |
| Net tonnage |  | 2,067 |  | 2,051 | 15 | 2,889 |
| Sail |  |  |  | 7 |  | 7 |
| Net tonnage |  |  |  | 90 |  | 90 |
| Total vessels |  | 192 |  | 156 | 1 | 247 |
| Total net tonnage |  | 2,067 |  | 2,141 | 15 | 2,979 |
| Boats: |  |  |  |  |  |  |
| Motor |  | 388 |  | 28 | 47 | 444 |
| Other |  |  |  |  | 485 | 608 |
| Apparatus: |  |  |  |  |  |  |
| Number | 18 | 580 | 59 | 368 | 639 |  |
| Yards at mouth |  | 9,215 |  | 369 |  |  |

## *Fisheries of Mississippi, 1938*—Continued

### CATCH: By gear

| Species | Trammel nets | | Lines: Hand | | Lines: Troll | | Lines: Trot with baits or snoods | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | 13,700 | $411 | | | | | | |
| Drum: | | | | | | | | |
| Black | 6,200 | 186 | 1,700 | $51 | | | | |
| Red or redfish | 90,200 | 5,460 | 15,800 | 1,086 | | | | |
| Flounders | 6,500 | 635 | | | | | | |
| Groupers | | | 157,600 | 4,370 | | | | |
| King whiting or "kingfish" | 3,700 | 111 | | | | | | |
| Mullet | 278,600 | 8,258 | | | | | | |
| Pompano | 600 | 90 | | | | | | |
| Sea catfish | 1,200 | 29 | 1,000 | 25 | | | | |
| Sheepshead, salt-water | 14,900 | 741 | 4,800 | 240 | | | | |
| Snapper, red | | | 173,900 | 12,173 | | | | |
| Spanish mackerel | 1,500 | 180 | | | 500 | $75 | | |
| Spot | 1,000 | 30 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 173,900 | 16,118 | 75,100 | 7,148 | | | | |
| White | 14,100 | 420 | 21,200 | 634 | | | | |
| Tripletail | 100 | 3 | | | | | | |
| Crabs, hard | | | | | | | 1,009,000 | $17,163 |
| Total | 606,200 | 32,672 | 451,100 | 25,727 | 500 | 75 | 1,009,000 | 17,163 |

| Species | Dip nets, drop | | Cast nets | | Otter trawls | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Mullet | | | 6,000 | $180 | | |
| Crabs, hard | 7,400 | $133 | | | | |
| Shrimp | | | | | 9,902,400 | $420,549 |
| Total | 7,400 | 133 | 6,000 | 180 | 9,902,400 | 420,549 |

| Species | Spears | | Dredges | | Tongs | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders | 35,800 | $3,436 | | | | |
| Oysters, market: | | | | | | |
| Public, spring | | | 998,000 | $40,173 | 1,044,500 | $51,620 |
| Public, fall | | | 21,400 | 909 | 177,500 | 10,382 |
| Total | 35,800 | 3,436 | 1,019,400 | 41,082 | 1,222,000 | 62,002 |

NOTE.—The production of fishery products by Mississippi craft in Louisiana waters has been included with the catch for Louisiana. These catches were as follows: Haul seines, shrimp, 30,000 pounds, valued at $1,277; oyster dredges, spring oysters, 3,626,100 pounds, valued at $141,423, and fall oysters, 1,453,000 pounds valued at $61,068; oyster tongs, spring oysters, 125,300 pounds, valued at $6,440, and fall oysters, 9,700 pounds, valued at $558; and shrimp trawls, shrimp, 7,373,400 pounds, valued at $313,820. The entire catch by haul seines was made in Louisiana waters.

### OPERATING UNITS: By counties

| Item | Hancock | Harrison | Jackson |
|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* |
| On vessels | 32 | 920 | 28 |
| On boats and shore: | | | |
| Regular | 143 | 1,219 | 174 |
| Casual | 28 | 64 | 37 |
| Total | 203 | 2,203 | 239 |
| Vessels: | | | |
| Motor | 8 | 225 | 7 |
| Net tonnage | 90 | 2,703 | 96 |
| Sail | 2 | 5 | |
| Net tonnage | 24 | 66 | |
| Total vessels | 10 | 230 | 7 |
| Total net tonnage | 114 | 2,769 | 96 |

### *Fisheries of Mississippi, 1938*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Hancock | Harrison | Jackson |
|---|---|---|---|
| Boats: | *Number* | *Number* | *Number* |
| Motor | 50 | 343 | 51 |
| Other | 62 | 421 | 125 |
| Apparatus: | | | |
| Haul seines | | 6 | |
| Length, yards | | 2, 400 | |
| Trammel nets | 13 | 22 | 25 |
| Square yards | 7, 500 | 11, 500 | 12, 500 |
| Lines: | | | |
| Hand | 23 | 47 | 38 |
| Hooks | 23 | 57 | 48 |
| Troll | 4 | | |
| Hooks | 4 | | |
| Trot with baits or snoods | 2 | 73 | 31 |
| Baits or snoods | 1, 500 | 70, 200 | 16, 800 |
| Dip nets, drop | 16 | 42 | |
| Cast nets | | 14 | 4 |
| Otter trawls, shrimp | 46 | 498 | 36 |
| Yards at mouth | 725 | 7, 951 | 569 |
| Spears | 16 | 27 | 16 |
| Dredges, oyster | 10 | 350 | 8 |
| Yards at mouth | 10 | 351 | 8 |
| Tongs, oyster | 50 | 506 | 83 |

CATCH: BY COUNTIES

| Species | Hancock | | Harrison | | Jackson | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | 5, 200 | $156 | 5, 300 | $159 | 3, 200 | $96 |
| Drum: | | | | | | |
| Black | 2, 400 | 72 | 5, 000 | 150 | 500 | 15 |
| Red or redfish | 46, 200 | 3, 696 | 56, 600 | 2, 700 | 3, 200 | 150 |
| Flounders | 9, 400 | 940 | 19, 400 | 1, 940 | 13, 500 | 1, 191 |
| Groupers | | | 78, 800 | 2, 006 | 78, 800 | 2, 364 |
| King whiting or "kingfish" | 900 | 27 | 2, 000 | 60 | 800 | 24 |
| Mullet | 30, 000 | 900 | 59, 200 | 1, 776 | 195, 400 | 5, 762 |
| Pompano | | | 400 | 60 | 200 | 30 |
| Sea catfish | | | 2, 000 | 50 | 200 | 4 |
| Sheepshead, salt-water | 3, 900 | 195 | 5, 900 | 295 | 9, 900 | 491 |
| Snapper, red | | | 87, 000 | 6, 090 | 86, 900 | 6, 083 |
| Spanish mackerel | 500 | 75 | | | 1, 500 | 180 |
| Spot | | | | | 1, 000 | 30 |
| Squeteagues or "sea trout": | | | | | | |
| Spotted | 64, 800 | 6, 480 | 81, 100 | 7, 461 | 103, 100 | 9, 325 |
| White | 7, 400 | 222 | 21, 000 | 630 | 6, 900 | 202 |
| Tripletail | | | 100 | 3 | | |
| Crabs, hard | 5, 600 | 112 | 783, 800 | 13, 716 | 227, 000 | 3, 468 |
| Shrimp | 424, 000 | 18, 220 | 8, 524, 000 | 361, 916 | 954, 400 | 40, 413 |
| Oysters, market: | | | | | | |
| Public spring | 117, 500 | 5, 788 | 1, 834, 700 | 81, 786 | 90, 300 | 4, 219 |
| Public, fall | 17, 000 | 983 | 123, 600 | 6, 900 | 58, 300 | 3, 408 |
| Total | 734, 800 | 37, 866 | 11, 689, 900 | 487, 698 | 1, 835, 100 | 77, 455 |

NOTE.—The catch of fishery products by Mississippi craft in Louisiana waters has been included with the catch for Louisiana

## LOUISIANA

### *Fisheries of Louisiana, 1938*

OPERATING UNITS: By gear

| Item | Haul seines | Tramme nets | Lines | | Dip nets | |
|---|---|---|---|---|---|---|
| | | | Hand | Trot with baits or snoods | Common | Drop |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | 5 | | | |
| On boats and shore: | | | | | | |
| Regular | 224 | 44 | 132 | 477 | 20 | 77 |
| Casual | 25 | 10 | 145 | 218 | 17 | 83 |
| Total | 249 | 54 | 282 | 695 | 37 | 160 |
| Vessels, motor | | | 1 | | | |
| Net tonnage | | | 14 | | | |
| Boats: | | | | | | |
| Motor | 37 | 18 | 75 | 75 | 1 | 17 |
| Other | 70 | 12 | 130 | 576 | 34 | 133 |
| Apparatus: | | | | | | |
| Number | 74 | 30 | 282 | 651 | 37 | 6,775 |
| Length, yards | 29,400 | | | | | |
| Square yards | | 8,500 | | | | |
| Hooks, baits, or snoods | | | 351 | 184,005 | | |

| Item | Otter trawls, shrimp | Brush traps | Dredges, oyster | Tongs, oyster | By hand, other than for oysters | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 391 | | 86 | | | 468 |
| On boats and shore: | | | | | | |
| Regular | 2,775 | 141 | 152 | 615 | 15 | 4,412 |
| Casual | | | | 88 | | 525 |
| Total | 3,166 | 141 | 238 | 703 | 15 | 5,405 |
| Vessels, motor | 181 | | 21 | | | 196 |
| Net tonnage | 1,459 | | 169 | | | 1,580 |
| Boats: | | | | | | |
| Motor | 1,364 | 25 | 37 | 145 | | 1,734 |
| Other | | 116 | | 375 | | 1,395 |
| Apparatus: | | | | | | |
| Number | 1,545 | 29,600 | 116 | 703 | | |
| Yards at mouth | 21,492 | | 115 | | | |

CATCH: By gear

| Species | Haul seines | | Trammel nets | | Lines | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Hand | | Trot with baits or snoods | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | 43,400 | $1,431 | 19,400 | $697 | 15,400 | $519 | | |
| Drum: | | | | | | | | |
| Black | 63,100 | 2,616 | 16,800 | 652 | 37,300 | 1,372 | | |
| Red or redfish | 307,600 | 22,729 | 70,200 | 5,283 | 144,200 | 10,042 | | |
| Flounders | 25,100 | 1,820 | 5,600 | 438 | 3,000 | 208 | | |
| Groupers | | | | | 6,000 | 180 | | |
| King whiting or "kingfish" | 2,000 | 66 | 1,100 | 51 | 300 | 10 | | |
| Mullet | 10,600 | 354 | 1,200 | 38 | | | | |
| Pompano | | | 500 | 90 | | | | |
| Sea catfish | 1,500 | 37 | 1,100 | 25 | 3,100 | 74 | | |
| Sheepshead, salt-water | 40,700 | 2,242 | 13,600 | 698 | 14,700 | 713 | | |
| Snapper, red | | | | | 85,000 | 5,600 | | |
| Spanish mackerel | 9,000 | 990 | 5,400 | 540 | 2,000 | 230 | | |
| Spot | 3,200 | 124 | 900 | 33 | 700 | 31 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 263,300 | 23,678 | 102,400 | 8,571 | 124,500 | 10,388 | | |
| White | 20,300 | 865 | 11,700 | 412 | 16,400 | 619 | | |
| Crabs: | | | | | | | | |
| Hard | 208,000 | 2,200 | | | | | 9,767,500 | $98,687 |
| Soft and peelers | 91,000 | 13,650 | | | | | | |
| Shrimp | 833,000 | 26,170 | | | | | | |
| Total | 1,921,800 | 98,972 | 249,900 | 17,528 | 452,600 | 29,986 | 9,767,500 | 98,687 |

## *Fisheries of Louisiana, 1938*—Continued

### CATCH: By gear—Continued

| Species | Dip nets | | | | Otter trawls | | Brush traps | |
|---|---|---|---|---|---|---|---|---|
| | Common | | Drop | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders | | | | | 3, 200 | $256 | | |
| King whiting or "kingfish" | | | | | 600 | 24 | | |
| Crabs: | | | | | | | | |
| Hard | 49, 300 | $493 | 508, 400 | $5, 084 | | | | |
| Soft and peelers | 13, 500 | 2, 015 | 62, 200 | 9, 234 | | | 81, 000 | $12, 000 |
| Shrimp | | | | | 80, 545, 900 | 2, 576, 566 | | |
| Total | 62, 800 | 2, 508 | 570, 600 | 14, 318 | 80, 549, 700 | 2, 576, 846 | 81, 000 | 12, 000 |

| Species | Dredges | | Tongs | | By hand | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Oysters, market: | | | | | | |
| Public, spring | 4, 231, 300 | $176, 603 | 209, 000 | $11, 244 | | |
| Public, fall | 1, 616, 600 | 72, 201 | 35, 200 | 2, 108 | | |
| Private, spring | 809, 100 | 47, 887 | 2, 270, 800 | 152, 556 | | |
| Private, fall | 108, 300 | 6, 600 | 942, 000 | 70, 535 | | |
| Terrapin, diamond-back | | | | | 4, 900 | $935 |
| Total | 6, 765, 300 | 303, 291 | 3, 457, 000 | 236, 443 | 4, 900 | 935 |

NOTE.—The catch as shown above for Louisiana includes the following products which were taken by Mississippi craft in Louisiana waters: Shrimp, 7,403,400 pounds, valued at $315,097; oysters, market, spring, 3,751,400 pounds, valued at $147,863; and oysters, market, fall, 1,462,700 pounds, valued at $61,626. Prior to 1938 similar catches by Mississippi craft were included with the catch for Mississippi.

### OPERATING UNITS: By parishes

| Item | Assumption | Calcasieu | Cameron | Iberia | Jefferson | La-Fourche | Orleans | Plaquemines |
|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | | | 22 | | 50 | 70 | 34 | 40 |
| On boats and shore: | | | | | | | | |
| Regular | 20 | 7 | 213 | 10 | 946 | 357 | 171 | 524 |
| Casual | 60 | 5 | 8 | 9 | 28 | 1 | 60 | 121 |
| Total | 80 | 12 | 243 | 19 | 1, 024 | 428 | 265 | 685 |
| Vessels, motor | | | 11 | | 21 | 34 | 10 | 16 |
| Net tonnage | | | 102 | | 195 | 236 | 79 | 118 |
| Boats: | | | | | | | | |
| Motor | 10 | | 102 | 3 | 354 | 169 | 40 | 167 |
| Other | 70 | 11 | 17 | 12 | 241 | 23 | 124 | 315 |
| Apparatus: | | | | | | | | |
| Haul seines | | | 1 | 3 | 6 | 2 | 10 | 5 |
| Length, yards | | | 350 | 750 | 2, 400 | 650 | 3, 200 | 2, 150 |
| Trammel nets | | | | 4 | 3 | 1 | | 6 |
| Square yards | | | | 1, 200 | 600 | 100 | | 1, 500 |
| Lines: | | | | | | | | |
| Hand | | | 14 | 5 | 41 | 2 | 34 | 31 |
| Hooks | | | 32 | 10 | 46 | 2 | 36 | 33 |
| Trot with baits or snoods | 80 | 11 | 5 | 3 | 115 | | 11 | 164 |
| Baits or snoods | 1, 600 | 4, 300 | 1, 200 | 900 | 36, 000 | | 5, 550 | 61, 455 |
| Dip nets: | | | | | | | | |
| Common | | | | | | | 7 | |
| Drop | | | | | | | 4, 005 | |
| Otter trawls, shrimp | | | 109 | | 332 | 194 | 5 | 129 |
| Yards at mouth | | | 1, 626 | | 4, 357 | 2, 567 | 73 | 1, 826 |
| Brush traps | | | | | 29, 600 | | | |
| Dredges, oyster | | | | | 4 | | 20 | 18 |
| Yards at mouth | | | | | 4 | | 20 | 18 |
| Tongs, oyster | | | 7 | 3 | | 40 | 101 | 209 |

## *Fisheries of Louisiana, 1938*—Continued

### OPERATING UNITS: BY PARISHES—Continued

| Item | St. Bernard | St. Charles | St. Mary | St. Tammany | Tangipahoa | Terrebonne | Vermilion |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 24 | -------- | 105 | -------- | -------- | 117 | 6 |
| On boats and shore: | | | | | | | |
| Regular | 259 | 40 | 743 | 35 | 10 | 1,007 | 70 |
| Casual | 91 | 20 | 12 | 32 | 12 | 32 | 34 |
| Total | 374 | 60 | 860 | 67 | 22 | 1,156 | 110 |
| Vessels, motor | 7 | -------- | 45 | -------- | -------- | 50 | 2 |
| Net tonnage | 48 | -------- | 427 | -------- | -------- | 357 | 18 |
| Boats: | | | | | | | |
| Motor | 78 | 10 | 347 | 9 | 4 | 422 | 19 |
| Other | 205 | 50 | 71 | 52 | 18 | 143 | 43 |
| Apparatus: | | | | | | | |
| Haul seines | 30 | -------- | 1 | 2 | -------- | 6 | 8 |
| Length, yards | 11,400 | -------- | 350 | 450 | -------- | 1,800 | 5,900 |
| Trammel nets | 6 | -------- | -------- | -------- | -------- | 5 | 5 |
| Square yards | 1,700 | -------- | -------- | -------- | -------- | 800 | 2,600 |
| Lines: | | | | | | | |
| Hand | 56 | -------- | 5 | 17 | -------- | 52 | 25 |
| Hooks | 70 | -------- | 10 | 20 | -------- | 62 | 30 |
| Trot with baits or snoods | 99 | 60 | 80 | -------- | -------- | 3 | 20 |
| Baits or snoods | 27,200 | 21,000 | 16,000 | -------- | -------- | 300 | 8,500 |
| Dip nets: | | | | | | | |
| Common | -------- | -------- | -------- | 20 | 10 | -------- | -------- |
| Drop | 670 | -------- | -------- | 1,500 | 600 | -------- | -------- |
| Otter trawls, shrimp | 41 | -------- | 357 | 3 | -------- | 368 | 7 |
| Yards at mouth | 573 | -------- | 5,462 | 44 | -------- | 4,866 | 98 |
| Dredges, oyster | 12 | -------- | 4 | 4 | -------- | 36 | 18 |
| Yards at mouth | 12 | -------- | 4 | 4 | -------- | 36 | 17 |
| Tongs, oyster | 5 | -------- | 34 | 3 | -------- | 289 | 12 |

### CATCH: BY PARISHES

| Species | Assumption | | Calcasieu | | Cameron | | Iberia | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | -------- | -------- | -------- | -------- | 2,300 | $69 | 2,100 | $84 |
| Drum: | | | | | | | | |
| Black | -------- | -------- | -------- | -------- | 200 | 8 | 600 | 30 |
| Red or redfish | -------- | -------- | -------- | -------- | 2,600 | 208 | 7,400 | 563 |
| Flounders | -------- | -------- | -------- | -------- | -------- | -------- | 2,600 | 130 |
| Sheepshead, salt-water | -------- | -------- | -------- | -------- | 1,000 | 50 | 2,100 | 105 |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | -------- | -------- | -------- | -------- | 12,300 | 1,230 | 8,700 | 871 |
| White | -------- | -------- | -------- | -------- | 700 | 35 | 600 | 22 |
| Crabs, hard | 62,000 | $930 | 72,000 | $800 | 30,400 | 456 | 36,000 | 360 |
| Shrimp | -------- | -------- | -------- | -------- | 3,324,700 | 103,069 | -------- | -------- |
| Oysters, market: | | | | | | | | |
| Public, spring | -------- | -------- | -------- | -------- | -------- | -------- | 2,600 | 200 |
| Public, fall | -------- | -------- | -------- | -------- | 5,100 | 414 | 2,500 | 220 |
| Total | 62,000 | 930 | 72,000 | 800 | 3,379,300 | 105,539 | 65,200 | 2,585 |

| Species | Jefferson | | Lafourche | | Orleans | | Plaquemines | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | 6,000 | $180 | -------- | -------- | 7,000 | $268 | 1,300 | $49 |
| Drum: | | | | | | | | |
| Black | 15,000 | 450 | 200 | $8 | 14,200 | 502 | 4,000 | 140 |
| Red or redfish | 21,000 | 1,260 | 900 | 54 | 37,500 | 2,470 | 34,600 | 2,112 |
| Flounders | 800 | 64 | -------- | -------- | 1,000 | 80 | 3,600 | 288 |
| Groupers | 6,000 | 180 | -------- | -------- | -------- | -------- | -------- | -------- |
| King whiting or "kingfish" | 1,200 | 48 | -------- | -------- | -------- | -------- | 200 | 14 |
| Mullet | -------- | -------- | -------- | -------- | 3,000 | 90 | -------- | -------- |
| Pompano | 500 | 90 | -------- | -------- | -------- | -------- | -------- | -------- |
| Sea catfish | 2,500 | 50 | -------- | -------- | -------- | -------- | -------- | -------- |
| Sheepshead, salt-water | 4,000 | 160 | -------- | -------- | 17,200 | 983 | 2,700 | 164 |
| Snapper, red | 45,000 | 3,200 | -------- | -------- | -------- | -------- | -------- | -------- |
| Spanish mackerel | 5,000 | 500 | -------- | -------- | -------- | -------- | 2,400 | 270 |
| Spot | 200 | 6 | -------- | -------- | 900 | 39 | -------- | -------- |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 66,000 | 5,130 | 1,200 | 96 | 45,000 | 3,670 | 37,500 | 3,620 |
| White | 10,000 | 300 | 200 | 8 | 3,300 | 158 | 3,300 | 149 |

## *Fisheries of Louisiana, 1938*—Continued

### CATCH: BY PARISHES—Continued

| Species | Jefferson | | Lafourche | | Orleans | | Plaquemines | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs: | | | | | | | | |
| Hard | 2, 958, 200 | $29, 582 | | | 668, 400 | $6, 684 | 578, 000 | $5, 780 |
| Soft and peelers | 81, 000 | 12, 000 | | | | | | |
| Shrimp | 16, 565, 300 | 513, 530 | 9, 680, 000 | $294,090 | 237, 800 | 7, 395 | 5, 193, 600 | 160, 996 |
| Oysters, market: | | | | | | | | |
| Public, spring | | | | | 101, 700 | 8, 208 | 7, 800 | 360 |
| Public, fall | | | | | 63, 100 | 5, 260 | 47, 400 | 2, 240 |
| Private, spring | 78, 200 | 6, 250 | 67, 100 | 4, 680 | 886, 300 | 67, 000 | 910, 500 | 55, 812 |
| Private, fall | | | 54, 500 | 4, 600 | 339, 300 | 28, 275 | 422, 100 | 25, 390 |
| Total | 19, 865, 900 | 572, 980 | 9, 804, 100 | 303, 536 | 2, 425, 700 | 131, 082 | 7, 249, 000 | 257, 384 |

| Species | St. Bernard | | St. Charles | | St. Mary | | St. Tammany | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | 44, 500 | $1, 460 | | | | | 1, 000 | $48 |
| Drum: | | | | | | | | |
| Black | 56, 800 | 2, 456 | | | | | | |
| Red or redfish | 293, 700 | 23, 796 | | | 25, 900 | $1, 554 | 5, 400 | 394 |
| Flounders | 25, 100 | 1, 857 | | | | | 500 | 39 |
| King whiting or "kingfish" | 2, 600 | 89 | | | | | | |
| Mullet | 8, 800 | 302 | | | | | | |
| Sea catfish | 1, 400 | 32 | | | | | | |
| Sheepshead, salt-water | 27, 300 | 1, 418 | | | | | 2, 500 | 125 |
| Snapper, red | | | | | 40, 000 | 2, 400 | | |
| Spanish mackerel | 9, 000 | 990 | | | | | | |
| Spot | 2, 900 | 111 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 211, 900 | 18, 970 | | | 1, 200 | 96 | 14, 200 | 1, 169 |
| White | 15, 400 | 660 | | | | | 1, 000 | 30 |
| Crabs: | | | | | | | | |
| Hard | 3, 140, 000 | 31, 700 | 640, 500 | $6, 405 | 2, 035, 800 | 20, 358 | 163, 200 | 1, 632 |
| Soft and peelers | 88, 200 | 13, 234 | | | | | 63, 200 | 9, 470 |
| Shrimp | 9, 630, 000 | 384, 122 | | | 19, 042, 300 | 590, 396 | 10, 200 | 316 |
| Oysters, market: | | | | | | | | |
| Public, spring | 3, 816, 100 | 151, 532 | | | 26, 400 | 1, 760 | 38, 500 | 1, 984 |
| Public, fall | 1, 462, 700 | 61, 626 | | | 27, 400 | 2, 070 | 8, 800 | 496 |
| Private, spring | 800 | 77 | | | 73, 300 | 5, 600 | | |
| Private, fall | 400 | 40 | | | 50, 500 | 5, 000 | | |
| Terrapin, diamond-back | 2, 000 | 500 | | | | | | |
| Total | 18, 839, 600 | 694, 972 | 640, 500 | 6, 405 | 21, 322, 800 | 629, 234 | 308, 500 | 15, 703 |

| Species | Tangipahoa | | Terrebonne | | Vermilion | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | | | 7, 200 | $285 | 6, 800 | $204 |
| Drum: | | | | | | |
| Black | | | 24, 200 | 963 | 2, 000 | 83 |
| Red or redfish | | | 86, 700 | 5, 202 | 6, 300 | 441 |
| Flounders | | | 3, 300 | 264 | | |
| Sea catfish | | | 1, 800 | 54 | | |
| Sheepshead, salt-water | | | 3, 500 | 140 | 8, 700 | 508 |
| Spot | | | 800 | 32 | | |
| Squeteagues or "sea trout": | | | | | | |
| Spotted | | | 60, 600 | 5, 257 | 31, 600 | 2, 528 |
| White | | | 11, 300 | 430 | 2, 600 | 104 |
| Crabs: | | | | | | |
| Hard | 15, 500 | $155 | 11, 300 | 146 | 121, 900 | 1, 476 |
| Soft and peelers | 15, 300 | 2, 195 | | | | |
| Shrimp | | | 17, 393, 800 | 539, 474 | 301, 200 | 9, 348 |
| Oysters, market: | | | | | | |
| Public, spring | | | 144, 900 | 8, 183 | 302, 300 | 15, 620 |
| Public, fall | | | 14, 300 | 890 | 20, 500 | 1, 093 |
| Private, spring | | | 738, 100 | 42, 418 | 325, 600 | 18, 606 |
| Private, fall | | | 171, 500 | 13, 130 | 12, 000 | 700 |
| Terrapin, diamond-back | | | 2, 900 | 435 | | |
| Total | 30, 800 | 2, 350 | 18, 676, 200 | 617, 303 | 1, 141, 500 | 50, 711 |

NOTE.—The catch as shown above for St. Bernard Parish includes the following products which were taken by Mississippi craft in Louisiana waters: Shrimp, 7,403,400 pounds, valued at $315,097; oysters, market, spring, 3,751,400 pounds, valued at $147,863; and oysters, market, fall, 1,462,700 pounds, valued at $61,626. Prior to 1938 similar catches by Mississippi craft were included with the catch for Mississippi.

## TEXAS

### *Fisheries of Texas, 1938*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Gill nets | | Trammel nets | Lines | | | |
|---|---|---|---|---|---|---|---|---|
| | | Run-around | Stake | | Hand | Troll | Trot with baits or snoods | Trot with hooks |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | | 95 | | | |
| On boats and shore: | | | | | | | | |
| Regular | 72 | 70 | 135 | 112 | 67 | 1 | 7 | 36 |
| Casual | 48 | 14 | 5 | 115 | 218 | 5 | 36 | 79 |
| Total | 120 | 84 | 140 | 227 | 380 | 6 | 43 | 115 |
| Vessels, motor | | | | | 13 | | | |
| Net tonnage | | | | | 188 | | | |
| Boats: | | | | | | | | |
| Motor | 12 | 16 | 34 | 103 | 72 | 4 | 6 | 42 |
| Other | 12 | 5 | 55 | 8 | 176 | | 37 | 53 |
| Apparatus: | | | | | | | | |
| Number | 45 | 114 | 343 | 107 | 380 | 6 | 43 | 96 |
| Length, yards | 15, 135 | | | | | | | |
| Square yards | | 26, 850 | 81, 925 | 55, 850 | | | | |
| Hooks, baits, or snoods | | | | | 495 | 6 | 18, 560 | 66, 000 |

| Item | Dip nets | Otter trawls, shrimp | Pots, crab | Spears | Dredges, oyster | Tongs, oyster | By hand, oyster | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | 127 | | | 20 | | | 228 |
| On boats and shore: | | | | | | | | |
| Regular | 15 | 780 | 15 | 16 | 118 | 42 | | 1, 310 |
| Casual | 37 | 12 | 25 | 145 | 36 | 124 | 5 | 627 |
| Total | 52 | 919 | 40 | 161 | 174 | 166 | 5 | 2, 165 |
| Vessels, motor | | 59 | | | 5 | | | 70 |
| Net tonnage | | 543 | | | 48 | | | 718 |
| Boats: | | | | | | | | |
| Motor | | 373 | 9 | | 48 | 26 | | 606 |
| Other | 32 | | 15 | 23 | | 122 | | 382 |
| Apparatus: | | | | | | | | |
| Number | 52 | 432 | 934 | 161 | 58 | 166 | | |
| Yards at mouth | | 6, 391 | | | 58 | | | |

CATCH: BY GEAR

| Species | Haul seines | | Gill nets | | | | Trammel nets | |
|---|---|---|---|---|---|---|---|---|
| | | | Runaround | | Stake | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | 2, 000 | $60 | 4, 200 | $114 | 14, 500 | $318 | 22, 800 | $705 |
| Drum: | | | | | | | | |
| Black | 170, 900 | 6, 836 | 443, 000 | 9, 774 | 458, 100 | 9, 918 | 142, 700 | 5, 708 |
| Red or redfish | 102, 600 | 7, 712 | 108, 400 | 8, 222 | 179, 200 | 12, 909 | 286, 200 | 21, 968 |
| Flounders | 2, 600 | 253 | 2, 300 | 230 | 1, 100 | 110 | 9, 600 | 949 |
| King whiting or "kingfish" | | | | | | | 3, 800 | 160 |
| Mullet | 300 | 9 | 1, 300 | 52 | 500 | 20 | 2, 200 | 74 |
| Pompano | 500 | 90 | | | | | 3, 400 | 680 |
| Sea catfish | 200 | 6 | 7, 600 | 228 | 600 | 18 | 11, 300 | 345 |
| Sheepshead, salt-water | 3, 700 | 201 | 1, 700 | 85 | 2, 000 | 100 | 11, 600 | 640 |
| Snook or sergeantfish | 1, 300 | 91 | 700 | 28 | 1, 100 | 44 | 1, 100 | 77 |
| Spanish mackerel | | | 2, 800 | 181 | 1, 300 | 85 | 10, 300 | 725 |
| Spot | | | 400 | 12 | | | 3, 500 | 115 |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 194, 300 | 16, 308 | 487, 000 | 39, 399 | 690, 600 | 55, 594 | 437, 800 | 37, 958 |
| White | 4, 300 | 130 | 14, 200 | 443 | 2, 600 | 85 | 13, 500 | 467 |
| Total | 482, 700 | 31, 696 | 1, 073, 600 | 58, 768 | 1, 351, 600 | 79, 201 | 959, 800 | 70, 571 |

*Fisheries of Texas, 1938*—Continued

CATCH: BY GEAR—Continued

| Species | Lines | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Hand | | Troll | | Trot with baits or snoods | | Trot with hooks | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | 9,200 | $260 | | | | | 2,500 | $77 |
| Drum: | | | | | | | | |
| Black | 103,000 | 3,422 | | | | | 239,800 | 9,592 |
| Red or redfish | 74,600 | 5,653 | | | | | 108,800 | 8,443 |
| Flounders | 1,300 | 124 | | | | | 1,200 | 120 |
| Groupers | 31,600 | 1,002 | | | | | | |
| Jewfish | 7,600 | 230 | | | | | | |
| Kingfish or "king mackeral" | | | 1,900 | $76 | | | | |
| King whiting or "kingfish" | 7,200 | 288 | | | | | | |
| Pompano | 1,600 | 288 | | | | | | |
| Sea catfish | 2,400 | 72 | | | | | 13,000 | 390 |
| Sheepshead, salt-water | 1,800 | 92 | | | | | | |
| Snapper, red | 1,279,000 | 103,902 | | | | | | |
| Snook or sergeantfish | 2,600 | 182 | | | | | | |
| Spanish mackerel | 45,800 | 2,862 | 1,700 | 85 | | | | |
| Spot | 300 | 9 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 121,500 | 10,147 | | | | | 46,300 | 3,885 |
| White | 52,600 | 1,590 | | | | | 18,500 | 557 |
| Crabs, hard | | | | | 331,300 | $6,768 | | |
| Total | 1,742,100 | 130,123 | 3,600 | 161 | 331,300 | 6,768 | 430,100 | 23,064 |

| Species | Dip nets | | Otter trawls | | Pots, crab | | Spears | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders | | | | | | | 108,400 | $10,357 |
| Jewfish | | | 300 | $8 | | | | |
| Crabs, hard | 255,000 | $6,559 | | | 385,100 | $10,523 | | |
| Shrimp | | | 16,364,700 | 505,757 | | | | |
| Total | 255,000 | 6,559 | 16,365,000 | 505,765 | 385,100 | 10,523 | 108,400 | 10,357 |

| Species | Dredges | | Tongs | | By hand | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Oysters, market: | | | | | | |
| Public, spring | 428,800 | $30,978 | 122,900 | $10,440 | 3,400 | $306 |
| Public, fall | 486,100 | 34,904 | 125,800 | 10,795 | 2,100 | 189 |
| Private, spring | 30,000 | 2,180 | 49,000 | 4,164 | | |
| Private, fall | 48,700 | 3,682 | 59,100 | 5,023 | | |
| Total | 993,600 | 71,744 | 356,800 | 30,422 | 5,500 | 495 |

OPERATING UNITS: BY COUNTIES

| Item | Aransas | Brazoria | Calhoun | Cameron | Galveston | Harris |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 2 | | 6 | 14 | 142 | |
| On boats and shore: | | | | | | |
| Regular | 165 | 51 | 211 | 147 | 199 | 13 |
| Casual | 68 | 23 | 52 | 60 | 105 | 25 |
| Total | 235 | 77 | 269 | 221 | 446 | 38 |
| Vessels, motor | 1 | | 3 | 2 | 41 | |
| Net tonnage | 13 | | 19 | 20 | 481 | |
| Boats: | | | | | | |
| Motor | 79 | 29 | 91 | 48 | 109 | 11 |
| Other | 20 | 15 | 28 | 83 | 50 | 17 |
| Apparatus: | | | | | | |
| Haul seines | | | 5 | | 6 | |
| Length, yards | | | 550 | | 1,560 | |
| Gill nets: | | | | | | |
| Runaround | 30 | | | 65 | | |
| Square yards | 6,200 | | | 15,250 | | |
| Stake | 18 | | | 264 | | |
| Square yards | 2,900 | | | 63,660 | | |

### *Fisheries of Texas, 1938*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Aransas | Brazoria | Calhoun | Cameron | Galveston | Harris |
|---|---|---|---|---|---|---|
| Apparatus—Continued | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Trammel nets | 29 | | 24 | | 18 | 8 |
| Square yards | 20,600 | | 11,950 | | 3,700 | 2,600 |
| Lines: | | | | | | |
| Hand | 27 | 16 | 9 | 68 | 98 | |
| Hooks | 27 | 16 | 9 | 82 | 179 | |
| Troll | | | | 6 | | |
| Hooks | | | | 6 | | |
| Trot with baits or snoods | | | | | 24 | 16 |
| Baits or snoods | | | | | 12,800 | 4,800 |
| Trot with hooks | | 11 | 21 | | | 3 |
| Hooks | | 3,700 | 6,100 | | | 900 |
| Dip nets | 36 | | | | 5 | |
| Otter trawls, shrimp | 28 | 24 | 68 | 24 | 115 | |
| Yards at mouth | 409 | 335 | 1,003 | 350 | 1,735 | |
| Pots, crab | | | 710 | | 224 | |
| Spears | 24 | 4 | 19 | 3 | 9 | |
| Dredges, oyster | 19 | | 7 | | 2 | |
| Yards at mouth | 19 | | 7 | | 2 | |
| Tongs, oyster | 19 | 6 | 16 | 7 | 26 | 12 |

| Item | Jefferson | Kleberg | Matagorda | Nueces | San Patricio | Wallacy |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 16 | | 26 | 2 | 20 | |
| On boats and shore: | | | | | | |
| Regular | 51 | 10 | 147 | 176 | 132 | 5 |
| Casual | 3 | 18 | 48 | 135 | 74 | 16 |
| Total | 70 | 28 | 221 | 313 | 226 | 21 |
| Vessels, motor | 4 | | 8 | 1 | 10 | |
| Net tonnage | 33 | | 71 | 7 | 74 | |
| Boats: | | | | | | |
| Motor | 22 | 16 | 70 | 47 | 80 | 4 |
| Other | 3 | 14 | 20 | 100 | 19 | 13 |
| Apparatus: | | | | | | |
| Haul seines | | | 1 | 30 | 3 | |
| Length, yards | | | 175 | 12,500 | 350 | |
| Gill nets: | | | | | | |
| Runaround | | | 2 | 17 | | |
| Square yards | | | 1,300 | 4,100 | | |
| Stake | | | | 53 | 8 | |
| Square yards | | | | 13,800 | 1,565 | |
| Trammel nets | | | 13 | | 15 | |
| Square yards | | | 6,800 | | 10,200 | |
| Lines: | | | | | | |
| Hand | 12 | 17 | | 78 | 39 | 16 |
| Hooks | 24 | 17 | | 78 | 47 | 16 |
| Trot with baits or snoods | 3 | | | | | |
| Baits or snoods | 960 | | | | | |
| Trot with hooks | | 20 | | 20 | 12 | 9 |
| Hooks | | 18,300 | | 19,400 | 5,400 | 12,200 |
| Dip nets | | | | 4 | 7 | |
| Otter trawls, shrimp | 24 | | 55 | 21 | 73 | |
| Yards at mouth | 367 | | 790 | 302 | 1,100 | |
| Spears | | | 21 | 66 | 15 | |
| Dredges, oyster | | | 27 | 3 | | |
| Yards at mouth | | | 27 | 3 | | |
| Tongs, oyster | | | 31 | 43 | 6 | |

CATCH: BY COUNTIES

| Species | Aransas | | Brazoria | | Calhoun | | Cameron | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | 3,800 | $114 | 800 | $32 | 4,800 | $144 | 15,600 | $312 |
| Drum: | | | | | | | | |
| Black | 64,100 | 2,564 | 1,600 | 64 | 41,900 | 1,676 | 852,000 | 17,040 |
| Red or redfish | 68,200 | 5,456 | 13,900 | 973 | 63,100 | 4,504 | 195,600 | 13,692 |
| Flounders | 29,400 | 2,940 | 500 | 50 | 18,200 | 1,820 | 1,700 | 170 |
| Groupers | | | 600 | 24 | | | 1,200 | 38 |
| Jewfish | | | 200 | 7 | | | 1,100 | 36 |
| Kingfish or "king mackerel" | | | | | | | 1,900 | 76 |

*Fisheries of Texas, 1938*—Continued

CATCH: BY COUNTIES—Continued

| Species | Aransas | | Brazoria | | Calhoun | | Cameron | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Mullet | 600 | $28 | | | | | | |
| Pompano | | | | | 3, 400 | $680 | | |
| Sea catfish | 9, 400 | 282 | | | 18, 900 | 567 | | |
| Sheepshead, salt-water | | | | | 3, 100 | 155 | 2, 700 | $135 |
| Snapper, red | | | 21. 000 | $1, 680 | | | 98, 300 | 7, 064 |
| Snook or sergeantfish | | | | | 2, 400 | 168 | 1, 800 | 72 |
| Spanish mackerel | 7, 600 | 532 | | | 5, 800 | 440 | 3, 900 | 195 |
| Spot | | | | | | | 700 | 21 |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 145, 600 | 13, 104 | 1, 200 | 96 | 114, 200 | 9, 902 | 1, 105, 700 | 88, 456 |
| White | 2, 900 | 87 | 300 | 12 | 3, 400 | 119 | 2, 600 | 104 |
| Crabs, hard | 213, 000 | 5, 538 | | | 282, 100 | 8, 463 | | |
| Shrimp | 1, 087, 100 | 33, 699 | 660, 000 | 18, 460 | 1, 386, 400 | 42, 978 | 451, 500 | 13, 982 |
| Oysters, market: | | | | | | | | |
| Public, spring | 148, 900 | 11, 925 | 3, 800 | 290 | 5, 500 | 495 | 6, 600 | 594 |
| Public, fall | 200, 700 | 16, 092 | 4. 100 | 424 | 8, 000 | 714 | 4, 000 | 360 |
| Private, spring | | | | | 79, 000 | 6, 344 | | |
| Private, fall | | | | | 107, 800 | 8, 705 | | |
| Total | 1, 981, 300 | 92, 361 | 708, 000 | 22. 112 | 2, 148, 000 | 87, 874 | 2, 746, 900 | 142, 347 |

| Species | Galveston | | Harris | | Jefferson | | Kleberg | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | 5, 000 | $150 | 1, 300 | $40 | | | | |
| Drum: | | | | | | | | |
| Black | 22, 900 | 916 | 7, 800 | 312 | | | 118, 800 | $4, 752 |
| Red or redfish | 126, 600 | 10, 128 | 16, 500 | 1, 230 | | | 40, 100 | 3, 208 |
| Flounders | 4, 900 | 441 | 400 | 40 | | | 1, 000 | 100 |
| Groupers | 27, 500 | 859 | | | 1, 100 | $33 | | |
| Jewfish | 2, 900 | 86 | | | 700 | 19 | | |
| King whiting or "kingfish" | 3. 200 | 128 | | | | | | |
| Mullet | 2, 100 | 63 | | | | | | |
| Sea catfish | 500 | 16 | 500 | 20 | | | | |
| Sheepshead, salt-water | 7, 800 | 468 | | | | | | |
| Snapper, red | 975, 300 | 80, 444 | | | 172, 000 | 13, 760 | | |
| Spanish mackerel | 2, 100 | 189 | | | | | | |
| Spot | 2, 000 | 70 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 178, 700 | 16, 001 | 41, 200 | 2, 876 | | | 30, 000 | 2, 400 |
| White | 5, 900 | 177 | | | | | 900 | 27 |
| Crabs, hard | 267. 500 | 5, 390 | 181. 000 | 3, 620 | 6. 800 | 238 | | |
| Shrimp | 4, 171, 700 | 129, 323 | | | 1, 109, 400 | 35, 391 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 37, 300 | 3, 034 | 18. 000 | 1, 763 | | | | |
| Public, fall | 20, 000 | 1, 774 | 9, 000 | 915 | | | | |
| Total | 5, 863. 900 | 249. 657 | 275. 700 | 10. 816 | 1, 290. 000 | 49. 441 | 190, 800 | 10, 487 |

| Species | Matagorda | | Nueces | | San Patricio | | Wallacy | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | 6, 000 | $180 | 1, 100 | $33 | 16, 800 | $529 | | |
| Drum: | | | | | | | | |
| Black | 49. 900 | 1, 996 | 274, 000 | 10, 950 | 65, 500 | 2, 620 | 59, 000 | $2, 360 |
| Red or redfish | 73, 500 | 5, 514 | 188, 700 | 14, 851 | 54, 100 | 3, 791 | 19, 500 | 1, 560 |
| Flounders | 18, 000 | 1, 800 | 39, 300 | 3, 594 | 12, 900 | 1, 168 | 200 | 20 |
| Groupers | | | 900 | 36 | 300 | 12 | | |
| Jewfish | | | 3, 000 | 90 | | | | |
| King whiting or "kingfish" | 800 | 40 | 7, 000 | 280 | | | | |
| Mullet | | | 1, 600 | 64 | | | | |
| Pompano | | | 2, 100 | 378 | | | | |
| Sea catfish | | | 900 | 27 | 3, 900 | 117 | 1, 000 | 30 |
| Sheepshead, salt-water | 3, 400 | 170 | 3, 100 | 155 | 700 | 35 | | |
| Snapper, red | | | 7, 800 | 678 | 4, 600 | 276 | | |
| Snook or sergeantfish | | | | | 2, 600 | 182 | | |
| Spanish mackerel | 2, 200 | 154 | 32, 500 | 1, 960 | 7, 600 | 456 | 200 | 12 |
| Spot | 1, 500 | 45 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 89, 000 | 8, 010 | 142, 300 | 11, 384 | 128, 800 | 10, 990 | 800 | 72 |
| White | 5, 500 | 220 | 79, 700 | 2, 391 | 4, 500 | 135 | | |
| Crabs, hard | | | 17, 500 | 525 | 3, 500 | 76 | | |
| Shrimp | 2, 886. 500 | 89, 484 | 644, 500 | 19. 979 | 3, 967, 600 | 122, 461 | | |
| Oysters, market: | | | | | | | | |
| Public, spring | 303, 000 | 21, 085 | 28, 000 | 2, 255 | 4, 000 | 283 | | |
| Public, fall | 296, 300 | 19, 762 | 70, 100 | 5, 723 | 1, 800 | 124 | | |
| Total | 3, 735, 600 | 148, 460 | 1,544,100 | 75, 353 | 4, 279, 200 | 143, 255 | 80, 700 | 4, 054 |

## FISHERIES OF THE PACIFIC COAST STATES [11]

The yield of the commerical fisheries of the Pacific Coast States (Washington, Oregon, and California) during 1938 amounted to 1,525,884,600 pounds, valued at $26,086,301 to the fishermen, representing a decrease of 3 percent in volume and 9 percent in value as compared with the catch in the previous year. These fisheries gave employment to 23,635 fishermen as compared with 21,555 in 1937.

There were 341 fishery wholesale and manufacturing establishments in the 3 States in 1938 as compared with 330 in 1937. During 1938 these establishments employed 18,115 persons, paid $10,282,514 in salaries and wages, and produced manufactured products (canned, cured, packaged, and byproducts) valued at $48,621,239. In 1937 the wholesale and manufacturing firms employed 19,792 persons, paid $10,669,409 in salaries and wages, and produced manufactured products valued at $56,149,695.

*Fisheries of the Pacific Coast States, 1938*

SUMMARY OF CATCH

| Product | Washington | | Oregon | |
|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* |
| Fish | 146, 254, 300 | $5, 542, 490 | 64, 825, 700 | $2, 054, 579 |
| Shellfish, etc | 13, 376, 700 | 1, 089, 688 | 6, 902, 300 | 345, 006 |
| Total | 159, 631, 000 | 6, 632, 178 | 71, 728, 000 | 2, 399, 585 |

| Product | California | | Total | |
|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* |
| Fish | 1, 285, 239, 500 | $16, 389, 719 | 1, 496, 319, 500 | $23, 986, 788 |
| Shellfish, etc | 9, 286, 100 | 664, 819 | 29, 565, 100 | 2, 099, 513 |
| Total | 1, 294, 525, 600 | 17, 054, 538 | 1, 525, 884, 600 | 26, 086, 301 |

OPERATING UNITS: BY STATES

| Item | Washington | | | | Oregon | | |
|---|---|---|---|---|---|---|---|
| | Puget Sound district | Coastal district | Columbia River district | Total | Columbia River district | Coastal district | Total |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 3, 547 | 103 | 21 | 3, 671 | 110 | 91 | 201 |
| On boats and shore | 2, 130 | 5, 134 | 1, 015 | 8, 279 | 1, 900 | 1, 440 | 3, 340 |
| Total | 5, 677 | 5, 237 | 1, 036 | 11, 950 | 2, 010 | 1, 531 | 3, 541 |
| Vessels: | | | | | | | |
| Motor | 573 | 72 | 13 | 658 | 58 | 30 | 88 |
| Net tonnage | 12, 002 | 565 | 92 | 12, 659 | 523 | 381 | 904 |
| Sail | 3 | | | 3 | | | |
| Net tonnage | 1, 421 | | | 1, 421 | | | |
| Total vessels | 576 | 72 | 13 | 661 | 58 | 30 | 88 |
| Total net tonnage | 13, 423 | 565 | 92 | 14, 080 | 523 | 381 | 904 |
| Boats: | | | | | | | |
| Motor | 769 | 466 | 721 | 1, 956 | 1, 023 | 947 | 1, 970 |
| Other | 444 | 243 | 33 | 720 | 74 | 114 | 188 |
| Accessory boats | 321 | | | 321 | 1 | 1 | 2 |

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[11] Data on the operating units and catch of the fisheries of the Pacific Coast States have been taken largely from statistics collected by the various State agencies. Supplementary surveys, compilations, and analyses have been made by agents of this Bureau in order that the figures may be presented in a manner comparable with those of other sections. While statistics of the fisheries of California are for the calendar year, those for Oregon and Washington are for the fiscal year ending Mar. 31, 1939, except that statistics of the halibut fishery in these latter States are for the calendar year.

## *Fisheries of the Pacific Coast States, 1938*—Continued

OPERATING UNITS: BY STATES—Continued

| Item | Washington | | | | Oregon | | |
|---|---|---|---|---|---|---|---|
| | Puget Sound district | Coastal district | Columbia River district | Total | Columbia River district | Coastal district | Total |
| Apparatus: | | | | | | | |
| Purse seines: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Salmon | 229 | | | 229 | | | |
| Length, yards | 125, 950 | | | 125, 950 | | | |
| Pilchard or sardine[1] | 46 | | | 46 | 1 | 1 | 2 |
| Length, yards | 18, 390 | | | 18, 390 | 460 | 470 | 930 |
| Haul seines | 177 | 4 | 3 | 184 | 31 | 8 | 39 |
| Length, yards | 13, 008 | 280 | 500 | 13, 788 | 17, 393 | 1, 336 | 18, 729 |
| Gill nets: | | | | | | | |
| Drift | 452 | 217 | 474 | 1, 143 | 719 | 437 | 1, 156 |
| Square yards | 682, 520 | 418, 376 | 1, 312, 032 | 2, 412, 928 | 2, 291, 094 | 615, 733 | 2, 906, 827 |
| Set | [2] 5 | [2] 120 | | [2] 125 | 153 | 859 | 1, 012 |
| Square yards | 1, 200 | 26, 500 | | 27, 700 | 42, 840 | 309, 240 | 352, 080 |
| Lines: | | | | | | | |
| Trawl, set, and hand | 26, 655 | | 369 | 27, 024 | 1, 153 | 361 | 1, 514 |
| Hooks | 587, 283 | | 28, 290 | 615, 573 | 28, 790 | 9, 860 | 38, 650 |
| Troll | 1, 245 | 1, 045 | 400 | 2, 690 | 965 | 650 | 1, 615 |
| Hooks | 5, 503 | 4, 702 | 1, 768 | 11, 973 | 4, 265 | 2, 815 | 7, 080 |
| Pound nets | [2] 2 | | | [2] 2 | 32 | | 32 |
| Brush weirs | 4 | | | 4 | | | |
| Dip nets | 14 | 76 | 287 | 377 | 144 | | 144 |
| Reef nets | 74 | | | 74 | | | |
| Beam trawls | 8 | | | 8 | | | |
| Yards at mouth | 53 | | | 53 | | | |
| Otter trawls | 61 | | | 61 | | 1 | 1 |
| Yards at mouth | 915 | | | 915 | | 20 | 20 |
| Traps: | | | | | | | |
| Crab | 2, 673 | 3, 185 | | 5, 858 | | 19, 825 | 19, 825 |
| Crawfish, fresh-water | | | | | 1, 395 | | 1, 395 |
| Octopus | 270 | | | 270 | | | |
| Dredges, oyster | | 2 | | 2 | | | |
| Yards at mouth | | 4 | | 4 | | | |
| Tongs and rakes | 149 | 220 | | 369 | | 23 | 23 |
| Shovels | 476 | 4, 453 | | 4, 929 | | 276 | 276 |

| Item | California | | | | | | Grand total |
|---|---|---|---|---|---|---|---|
| | Northern district | San Francisco district | Monterey district | San Pedro district | San Diego district | Total | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 40 | 1, 197 | 627 | 2, 290 | 1, 209 | 5, 363 | 9, 235 |
| On boats and shore | 265 | 838 | 423 | 993 | 262 | 2, 781 | 14, 400 |
| Total | 305 | 2, 035 | 1, 050 | 3, 283 | 1, 471 | 8, 144 | 23, 635 |
| Vessels: | | | | | | | |
| Steam | | 1 | | | | 1 | 1 |
| Net tonnage | | 32 | | | | 32 | 32 |
| Motor | 21 | 124 | 66 | 263 | 121 | 595 | 1, 341 |
| Net tonnage | 185 | 5, 201 | 2, 740 | 9, 724 | 7, 712 | 25, 562 | 39, 125 |
| Sail | | | | | | | 3 |
| Net tonnage | | | | | | | 1, 421 |
| Total vessels | 21 | 125 | 66 | 263 | 121 | 596 | 1, 345 |
| Total net tonnage | 185 | 5, 233 | 2, 740 | 9, 724 | 7, 712 | 25, 594 | 40, 578 |

[1] Used in the pilchard fishery of the Washington and Oregon coasts by Puget Sound purse-seine vessels. See separate sections for catch statistics.

[2] Fished only on Indian reservations.

NOTE.—Statistics on the operating units for Washington include 50 motor vessels having a total capacity of 2,344 net tons and a total crew of 512 men, which also fished in California water and contributed to the catch in that State. The following gear was operated by these craft: 46 pilchard or sardine purse seines and 124 set and hand lines. Operating units for Oregon include 26 motor vessels, having a total capacity of 348 net tons, 18 motor boats, and 68 fishermen, which also operated in California waters and contributed to the catch in that State. These craft operated the following gear: 2 pilchard or sardine purse seines, and 192 troll lines. Statistics on the operating units for California include 32 motor vessels having a total capacity of 2,073 net tons, and a total crew of 360 men, which also operated pilchard or sardine purse seines in Washington and Oregon waters and contributed to the catch in those States. Thirteen of these vessels operated in Washington, 11 in Oregon, and 8 in both States.

*Fisheries of the Pacific Coast States, 1938*—Continued

OPERATING UNITS: BY STATES—Continued

| Item | California | | | | | | Grand total |
|---|---|---|---|---|---|---|---|
| | Northern district | San Francisco district | Monterey district | San Pedro district | San Diego district | Total | |
| Vessels—Continued. | | | | | | | |
| Boats: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Nnmber* |
| Motor | 211 | 524 | 214 | 588 | 120 | 1, 657 | 5, 583 |
| Other | 3 | 41 | 9 | 27 | 1 | 81 | 989 |
| Accessory boats | -------- | 101 | 68 | 294 | 138 | 601 | 924 |
| Apparatus: | | | | | | | |
| Purse seines: | | | | | | | |
| Mackerel | -------- | -------- | 2 | 16 | -------- | 18 | 18 |
| Length, yards | -------- | -------- | 850 | 7, 129 | -------- | 7, 979 | 7, 979 |
| Salmon | -------- | -------- | -------- | -------- | -------- | -------- | 229 |
| Length, yards | -------- | -------- | -------- | -------- | -------- | -------- | 125, 950 |
| Pilchard or sardine | -------- | 87 | 44 | 94 | -------- | 225 | 273 |
| Length, yards | -------- | 34, 245 | 16, 458 | 37, 618 | -------- | 88, 321 | 107, 641 |
| Tuna | -------- | 4 | 10 | 79 | -------- | 93 | 93 |
| Length, yards | -------- | 1, 080 | 6, 075 | 47, 480 | -------- | 54, 635 | 54, 635 |
| Lampara and ring nets: | | | | | | | |
| Mackerel | -------- | 1 | -------- | 51 | 14 | 66 | 66 |
| Length, yards | -------- | 550 | -------- | 29, 138 | 4, 970 | 34, 658 | 34, 658 |
| Pilchard or sardine | -------- | 12 | 13 | 64 | 18 | 107 | 107 |
| Length, yards | -------- | 3, 451 | 3, 628 | 33, 323 | 4, 680 | 45, 082 | 45, 082 |
| Tuna | -------- | -------- | -------- | 17 | 2 | 19 | 19 |
| Length, yards | -------- | -------- | -------- | 9, 775 | 640 | 10, 415 | 10, 415 |
| Other | -------- | -------- | 15 | 25 | 1 | 41 | 41 |
| Length, yards | -------- | -------- | 3, 895 | 6, 671 | 200 | 10, 766 | 10, 766 |
| Haul seines | -------- | 3 | -------- | -------- | -------- | 3 | 226 |
| Length, yards | -------- | 400 | -------- | -------- | -------- | 400 | 32, 917 |
| Gill nets: | | | | | | | |
| Drift: | | | | | | | |
| Barracuda | -------- | -------- | -------- | 17 | 7 | 24 | 24 |
| Square yards | -------- | -------- | -------- | 106, 012 | 29, 626 | 135, 638 | 135, 638 |
| Salmon | -------- | 144 | -------- | -------- | -------- | 144 | 2, 443 |
| Square yards | -------- | 465, 332 | -------- | -------- | -------- | 465, 332 | 5, 785, 087 |
| Sea bass | -------- | 6 | 19 | -------- | -------- | 25 | 25 |
| Square yards | -------- | 12, 800 | 35, 720 | -------- | -------- | 48, 520 | 48, 520 |
| Shad | -------- | 137 | -------- | -------- | -------- | 137 | 137 |
| Square yards | -------- | 389, 113 | -------- | -------- | -------- | 389, 113 | 389, 113 |
| Set: | | | | | | | |
| "California halibut" | -------- | -------- | 18 | -------- | -------- | 18 | 18 |
| Square yards | -------- | -------- | 55, 392 | -------- | -------- | 55, 392 | 55, 392 |
| Crab | -------- | -------- | 33 | -------- | -------- | 33 | 33 |
| Square yards | -------- | -------- | 55, 994 | -------- | -------- | 55, 994 | 55, 994 |
| Salmon | -------- | -------- | -------- | -------- | -------- | -------- | 1, 137 |
| Square yards | -------- | -------- | -------- | -------- | -------- | -------- | 379, 780 |
| Sea bass | -------- | -------- | -------- | 22 | 10 | 32 | 32 |
| Square yards | -------- | -------- | -------- | 73, 040 | 41, 703 | 114, 743 | 114, 743 |
| Miscellaneous | 12 | 55 | 32 | 26 | 6 | 131 | 131 |
| Square yards | 9, 600 | 86, 075 | 37, 110 | 28, 798 | 8, 318 | 169, 901 | 169, 901 |
| Trammel nets | -------- | -------- | -------- | 24 | 10 | 34 | 34 |
| Square yards | -------- | -------- | -------- | 121, 733 | 96, 613 | 218, 346 | 218, 346 |
| Lines: | | | | | | | |
| Trawl, set, and hand | 316 | 1, 600 | 764 | 2, 837 | 1, 387 | 6, 904 | 35, 442 |
| Hooks | 24, 159 | 140, 596 | 58, 564 | 496, 379 | 31, 257 | 750, 995 | 1, 405, 178 |
| Troll | 1, 299 | 992 | 1, 362 | 2, 792 | 608 | 7, 053 | 11, 358 |
| Hooks | 5, 436 | 2, 855 | 3, 682 | 2, 842 | 608 | 15, 423 | 34, 476 |
| Pound nets | -------- | -------- | -------- | -------- | -------- | -------- | 34 |
| Brush weirs | -------- | -------- | -------- | -------- | -------- | -------- | 4 |
| Fyke nets | -------- | 1, 660 | -------- | -------- | -------- | 1, 660 | 1, 660 |
| Dip nets | 29 | 4 | -------- | -------- | -------- | 33 | 554 |
| Bag nets, shrimp | -------- | 9 | -------- | -------- | -------- | 9 | 9 |
| Length, yards | -------- | 6, 496 | -------- | -------- | -------- | 6, 496 | 6, 496 |
| Reef nets | -------- | -------- | -------- | -------- | -------- | -------- | 74 |
| Paranzella nets | -------- | 9 | -------- | 3 | -------- | 12 | 12 |
| Yards at mouth | -------- | 150 | -------- | 50 | -------- | 200 | 200 |
| Beam trawls | -------- | 13 | -------- | -------- | -------- | 13 | 21 |
| Yards at mouth | -------- | 87 | -------- | -------- | -------- | 87 | 140 |
| Otter trawls | -------- | 3 | 9 | -------- | -------- | 12 | 74 |
| Yards at mouth | -------- | 35 | 105 | -------- | -------- | 140 | 1, 075 |
| Traps: | | | | | | | |
| Crab | 963 | 4, 950 | 68 | -------- | -------- | 5, 981 | 31, 664 |
| Crawfish, fresh-water | -------- | -------- | -------- | -------- | -------- | -------- | 1, 395 |
| Octopus | -------- | -------- | 94 | -------- | -------- | 94 | 364 |
| Sea crawfish | -------- | -------- | -------- | 4, 498 | 963 | 5, 461 | 5, 461 |
| Harpoons, swordfish | -------- | -------- | -------- | 47 | 25 | 72 | 72 |
| Dredges, oyster | -------- | -------- | -------- | -------- | -------- | -------- | 2 |
| Yards at mouth | -------- | -------- | -------- | -------- | -------- | -------- | 4 |
| Tongs and rakes | 3 | 54 | 4 | 4 | -------- | 65 | 457 |
| Shovels | 10 | 78 | 30 | 66 | -------- | 184 | 5, 389 |
| Abalone outfits | -------- | -------- | 13 | 5 | -------- | 18 | 18 |

## *Fisheries of the Pacific Coast States, 1938*—Continued

### CATCH: By States

| Species | Washington | | Oregon | |
|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* |
| FISH | | | | |
| Carp | 90, 800 | $2, 724 | ---------- | ---------- |
| Cod | 10, 351, 800 | 141, 666 | ---------- | ---------- |
| Flounders: | | | | |
| "Sole" | 4, 476, 700 | 130, 935 | 32, 800 | $1, 187 |
| Other | 606, 500 | 14, 384 | 185, 200 | 1, 963 |
| Halibut | 23, 084, 600 | 1, 875, 944 | 409, 300 | 27, 326 |
| Herring | 341, 400 | 3, 824 | 25, 500 | 383 |
| "Lingcod" | 2, 893, 700 | 71, 147 | 270, 300 | 7, 047 |
| Perch | 152, 800 | 4, 966 | 4, 200 | 92 |
| Pilchard or sardine | 52, 976, 100 | 291, 894 | 34, 035, 700 | 187, 196 |
| Rockfishes | 722, 800 | 30, 071 | 139, 700 | 3, 018 |
| Sablefish | 2, 768, 900 | 113, 607 | 124, 400 | 3, 778 |
| Salmon: | | | | |
| Blueback, red, or sockeye | 10, 598, 700 | 809, 933 | 292, 700 | 35, 124 |
| Chinook or king | 9, 488, 600 | 934, 667 | 11, 038, 600 | 963, 561 |
| Chum or keta | 10, 353, 000 | 241, 439 | 1, 977, 700 | 23, 996 |
| Humpback or pink | 39, 500 | 1, 185 | ---------- | ---------- |
| Silver or coho | 9, 101, 900 | 567, 928 | 7, 512, 800 | 362, 053 |
| Shad | 52, 700 | 1, 749 | 406, 700 | 16, 034 |
| Sharks, including grayfish | 578, 100 | 4, 153 | ---------- | ---------- |
| Smelts: | | | | |
| Eulachon | 2, 556, 900 | 65, 920 | 527, 300 | 35, 856 |
| Other | 438, 600 | 21, 055 | 1, 000 | 35 |
| Steelhead trout | 403, 800 | 25, 668 | 1, 860, 200 | 114, 199 |
| Striped bass | ---------- | ---------- | 44, 100 | 2, 192 |
| Sturgeon | 43, 600 | 1, 655 | 68, 600 | 1, 255 |
| Tuna, albacore | 4, 132, 800 | 185, 976 | 5, 868, 900 | 268, 284 |
| Total | 146, 254, 300 | 5, 542, 490 | 64, 825, 700 | 2, 054, 579 |
| SHELLFISH, ETC. | | | | |
| Crabs | 2, 612, 600 | 116, 676 | 6, 408, 800 | 291, 311 |
| Crawfish, fresh-water | ---------- | ---------- | 93, 700 | 8, 435 |
| Shrimp | 25, 100 | 3, 622 | ---------- | ---------- |
| Clams: | | | | |
| Hard | 862, 600 | 66, 680 | ---------- | ---------- |
| Razor | 1, 125, 100 | 187, 512 | 103, 300 | 24, 595 |
| Mixed | ---------- | ---------- | 92, 700 | 7, 961 |
| Octopus | 64, 200 | 3, 007 | ---------- | ---------- |
| Oysters, market: | | | | |
| Pacific | 8, 378, 300 | 523, 217 | 195, 100 | 8, 240 |
| Western or native | 262, 200 | 182, 299 | 8, 700 | 4, 464 |
| Scallops, bay | 20, 400 | 5, 147 | ---------- | ---------- |
| Squid | 15, 600 | 998 | ---------- | ---------- |
| Trepang | 10, 600 | 530 | ---------- | ---------- |
| Total | 13, 376, 700 | 1, 089, 688 | 6, 902, 300 | 345, 006 |
| Grand total | 159, 631, 000 | 6, 632, 178 | 71, 728, 000 | 2, 399, 585 |

| Species | California[1] | | Total | |
|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* |
| FISH | | | | |
| Anchovies | 735, 200 | $9, 306 | 735, 200 | $9, 306 |
| Barracuda | 2, 529, 500 | 158, 677 | 2, 529, 500 | 158, 677 |
| Cabrilla | 145, 100 | 7, 337 | 145, 100 | 7, 337 |
| Carp | 38, 900 | 847 | 129, 700 | 3, 571 |
| Catfish | 312, 300 | 40, 537 | 312, 300 | 40, 537 |
| Cod | ---------- | ---------- | 10, 351, 800 | 141, 666 |
| Flounders: | | | | |
| "California halibut" | 1, 094, 400 | 87, 521 | 1, 094, 400 | 87, 521 |
| "Sole" | 7, 737, 600 | 444, 442 | 12, 247, 100 | 576, 564 |
| Other | 1, 268, 000 | 58, 009 | 2, 059, 700 | 74, 356 |
| Flyingfish | 62, 900 | 2, 337 | 62, 900 | 2, 337 |
| Groupers | 68, 000 | 3, 499 | 68, 000 | 3, 499 |
| Hake | 36, 400 | 368 | 36, 400 | 368 |
| Halibut | 405, 800 | 27, 952 | 23, 899, 700 | 1, 931, 222 |
| Hardhead | 12, 900 | 1, 401 | 12, 900 | 1, 401 |
| Herring | 504, 900 | 2, 759 | 871, 800 | 6, 966 |
| Horse mackerel | 4, 133, 900 | 45, 651 | 4, 133, 900 | 45, 651 |
| Kingfish | 493, 200 | 13, 014 | 493, 200 | 13, 014 |
| "Lingcod" | 646, 000 | 26, 808 | 3, 810, 000 | 105, 002 |
| Mackerel | 79, 848, 000 | 858, 865 | 79, 848, 000 | 858, 865 |

[1] Includes the catch taken off Latin America.

## *Fisheries of the Pacific Coast States, 1938*—Continued

CATCH: BY STATES—Continued

| Species | California | | Total | |
|---|---|---|---|---|
| FISH—continued | *Pounds* | *Value* | *Pounds* | *Value* |
| Mullet | 3,800 | $295 | 3,800 | $295 |
| Perch | 155,800 | 7,028 | 312,800 | 12,086 |
| Pilchard or sardine | 1,023,389,500 | 5,832,273 | 1,110,401,300 | 6,311,363 |
| Pompano | 1,200 | 356 | 1,200 | 356 |
| Rock bass | 286,100 | 16,112 | 286,100 | 16,112 |
| Rockfishes | 3,643,100 | 157,331 | 4,505,600 | 190,420 |
| Rudderfish | 27,600 | 1,482 | 27,600 | 1,482 |
| Sablefish | 415,800 | 19,400 | 3,309,100 | 136,785 |
| Salmon: | | | | |
| Blueback, red, or sockeye | | | 10,891,400 | 845,057 |
| Chinook or king | 3,831,700 | 285,583 | 24,358,900 | 2,183,811 |
| Chum or keta | | | 12,330,700 | 265,435 |
| Humpback or pink | | | 39,500 | 1,185 |
| Silver or coho | | | 16,614,700 | 929,981 |
| Sculpin | 155,400 | 9,411 | 155,400 | 9,411 |
| Sea bass: | | | | |
| Black | 407,500 | 23,937 | 407,500 | 23,937 |
| White | 628,900 | 54,393 | 628,900 | 54,393 |
| Shad | 1,338,700 | 50,646 | 1,798,100 | 68,429 |
| Sharks, including grayfish | 7,513,800 | 137,343 | 8,091,900 | 141,496 |
| Sheepshead | 72,000 | 2,787 | 72,000 | 2,787 |
| Skates | 528,300 | 5,006 | 528,300 | 5,006 |
| Smelts: | | | | |
| Eulachon | | | 3,084,200 | 101,776 |
| Other | 567,900 | 26,911 | 1,007,500 | 48,001 |
| Spanish mackerel | 12,300 | 716 | 12,300 | 716 |
| Splittail | 11,100 | 398 | 11,100 | 398 |
| Squawfish | 1,000 | 37 | 1,000 | 37 |
| Steelhead trout | | | 2,264,000 | 139,867 |
| Striped bass | | | 44,100 | 2,192 |
| Sturgeon | | | 112,200 | 2,910 |
| Suckers | 500 | 17 | 500 | 17 |
| Swordfish | 722,500 | 80,802 | 722,500 | 80,802 |
| Tomcod | 3,100 | 49 | 3,100 | 49 |
| Tuna and tunalike fishes: | | | | |
| Albacore | 7,724,600 | 511,819 | 17,726,300 | 966,079 |
| Bluefin | 17,728,000 | 983,051 | 17,728,000 | 983,051 |
| Bonito | 7,753,000 | 285,615 | 7,753,000 | 285,615 |
| Skipjack or striped tuna | 22,653,600 | 1,132,680 | 22,653,600 | 1,132,680 |
| Yellowfin | 78,317,800 | 4,705,092 | 78,317,800 | 4,705,092 |
| Whitebait | 106,700 | 6,909 | 106,700 | 6,909 |
| Whitefish | 68,000 | 3,493 | 68,000 | 3,493 |
| Yellowtail | 6,812,300 | 253,225 | 6,812,300 | 253,225 |
| Other fish | 284,900 | 6,192 | 284,900 | 6,192 |
| Total | 1,285,239,500 | 16,389,719 | 1,496,319,500 | 23,986,788 |
| SHELLFISH, ETC. | | | | |
| Crabs | 3,877,500 | 249,835 | 12,898,900 | 657,822 |
| Crawfish, fresh-water | | | 93,700 | 8,435 |
| Sea crawfish or spiny lobster | 1,198,000 | 178,634 | 1,198,000 | 178,634 |
| Shrimp | 1,847,400 | 36,841 | 1,872,500 | 40,463 |
| Abalone | 424,300 | 91,979 | 424,300 | 91,979 |
| Clams: | | | | |
| Hard | 12,400 | 2,705 | 875,000 | 69,385 |
| Pismo | 53,600 | 11,391 | 53,600 | 11,391 |
| Razor | | | 1,228,400 | 212,107 |
| Soft | 27,900 | 5,835 | 27,900 | 5,835 |
| Mixed | | | 92,700 | 7,961 |
| Octopus | 32,600 | 2,103 | 96,800 | 5,110 |
| Oysters, market: | | | | |
| Eastern | 48,200 | 17,677 | 48,200 | 17,677 |
| Pacific | 161,000 | 30,688 | 8,734,400 | 562,145 |
| Western or native | 3,900 | 1,288 | 274,800 | 188,051 |
| Scallops, bay | | | 20,400 | 5,147 |
| Squid | 1,599,300 | 35,843 | 1,614,900 | 36,841 |
| Trepang | | | 10,600 | 530 |
| Total | 9,286,100 | 664,819 | 29,565,100 | 2,099,513 |
| Grand total | 1,294,525,600 | 17,054,538 | 1,525,884,600 | 26,086,301 |

## *Industries related to the fisheries of the Pacific Coast States, 1938*

### OPERATING UNITS, SALARIES, AND WAGES

| Item | Washington | Oregon | California | Total |
|---|---|---|---|---|
| Transporting: | *Number* | *Number* | *Number* | *Number* |
| Persons engaged: | | | | |
| On vessels | 134 | 41 | 15 | 190 |
| On boats | 1 | ----- | ----- | 1 |
| Total | 135 | 41 | 15 | 191 |
| Vessels, motor | 51 | 20 | 3 | 74 |
| Net tonnage | 1,227 | 257 | 55 | 1,539 |
| Boats | 1 | ----- | ----- | 1 |
| Wholesale and manufacturing: | | | | |
| Establishments | 117 | 50 | 174 | 341 |
| Persons engaged: | | | | |
| Proprietors | 67 | 33 | 215 | 315 |
| Salaried employees | 275 | 108 | 772 | 1,155 |
| Wage earners: | | | | |
| Average for season | 3,007 | 1,449 | 12,189 | 16,645 |
| Average for year | 1,237 | 718 | 4,110 | 6,065 |
| Paid to salaried employees | $636,310 | $266,757 | $2,122,430 | $3,025,497 |
| Paid to wage earners | $1,318,575 | $735,704 | $5,202,738 | $7,257,017 |
| Total salaries and wages | $1,954,885 | $1,002,461 | $7,325,168 | $10,282,514 |
| Fishermen manufacturing | 60 | 32 | 41 | 133 |

### PRODUCTS MANUFACTURED

| Item | Washington | | Oregon | | California | |
|---|---|---|---|---|---|---|
| By manufacturing firms: | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Barracuda, fresh fillets ... pounds | ----- | ----- | ----- | ----- | 300,000 | $44,575 |
| Cabrilla, fresh fillets ... do | ----- | ----- | ----- | ----- | 85,000 | 16,300 |
| Cod: | | | | | | |
| Fresh fillets ... do | 118,635 | $11,946 | ----- | ----- | ----- | ----- |
| Salted: | | | | | | |
| Dry, partly boned ... do | 1,714,005 | 109,660 | ----- | ----- | (1) | (1) |
| Boneless and absolutely boneless ... pounds | 837,497 | 126,258 | ----- | ----- | (1) | (1) |
| Flounders: | | | | | | |
| Fresh fillets ... do | 829,977 | 98,447 | (1) | (1) | 1,564,000 | 243,445 |
| Fresh steaks ... do | ----- | ----- | ----- | ----- | 420,000 | 86,500 |
| Halibut, frozen steaks ... do | 33,147 | 4,770 | ----- | ----- | ----- | ----- |
| "Lingcod," fresh fillets ... do | 117,992 | 9,505 | (1) | (1) | 140,000 | 22,500 |
| Mackerel: | | | | | | |
| Canned ... standard cases | ----- | ----- | ----- | ----- | 949,736 | 2,757,004 |
| Meal ... tons | ----- | ----- | ----- | ----- | 1,574 | 58,580 |
| Oil ... gallons | ----- | ----- | ----- | ----- | 86,364 | 25,878 |
| Pilchard or sardine: | | | | | | |
| Canned ... standard cases | ----- | ----- | ----- | ----- | 2,261,678 | 7,102,358 |
| Meal ... tons | 4,633 | 161,752 | 2,941 | $102,602 | 82,353 | 3,173,538 |
| Oil ... gallons | 1,213,639 | 360,896 | 718,830 | 213,525 | 15,607,098 | 4,630,916 |
| Rockfishes, fresh fillets ... pounds | (1) | (1) | (1) | (1) | 1,145,000 | 179,850 |
| Sablefish: | | | | | | |
| Salted ... do | 182,740 | 10,107 | ----- | ----- | ----- | ----- |
| Kippered ... do | 450,149 | 33,558 | ----- | ----- | 238,875 | 48,122 |
| Salmon: | | | | | | |
| Frozen steaks ... do | 7,386 | 1,025 | (1) | (1) | ----- | ----- |
| Salted, mild-cured [2] ... do | 3,211,825 | 671,480 | 1,233,310 | 254,923 | 1,377,675 | 242,471 |
| Kippered ... do | 2,002,805 | 252,500 | (1) | (1) | ----- | ----- |
| Smoked ... do | 336,394 | 57,191 | 52,671 | 15,505 | 187,522 | 70,724 |
| Canned: | | | | | | |
| Blueback, red, or sockeye ... standard cases | 138,232 | 1,903,772 | 11,931 | 220,158 | ----- | ----- |
| Chinook, or king ... do | 29,953 | 404,756 | 141,102 | 2,042,511 | ----- | ----- |
| Chum or keta ... do | 25,058 | 95,299 | 33,542 | 125,827 | ----- | ----- |
| Humpback or pink ... do | 380 | 2,376 | ----- | ----- | ----- | ----- |
| Silver or coho ... do | 13,495 | 123,141 | 63,772 | 638,850 | ----- | ----- |
| Steelhead trout ... do | 1,611 | 15,996 | 13,645 | 156,206 | ----- | ----- |
| Eggs for bait ... do | 4,454 | 80,436 | (1) | (1) | ----- | ----- |
| Oil ... gallons | ----- | ----- | [3] 24,287 | 34,904 | ----- | ----- |

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[1] The production of this item has been included under "Unclassified products."

[2] This item is usually an intermediate product and although included in the total, may be shown in its final stage of processing in this or another State.

[3] Includes the production of both edible and industrial salmon oils.

*Industries related to the fisheries of the Pacific Coast States, 1938*—Continued

PRODUCTS MANUFACTURED—Continued

| Item | Washington | | Oregon | | California | |
|---|---|---|---|---|---|---|
| By manufacturing firms—Continued. | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Sea bass: | | | | | | |
| Black, fresh steaks .......... pounds | ---------- | ---------- | ---------- | ---------- | 210,000 | $33,600 |
| White, fresh fillets .......... do | ---------- | ---------- | ---------- | ---------- | 143,000 | 28,600 |
| Shad: | | | | | | |
| Canned .......... standard cases | (1) | (1) | 2,280 | $6,840 | 7,655 | 20,380 |
| Roe, canned .......... do | 69 | $1,726 | 895 | 29,330 | 2,051 | 64,853 |
| Sharks, including grayfish, fresh fillets .......... pounds | ---------- | ---------- | ---------- | ---------- | 50,000 | 5,000 |
| Sheepshead, fresh fillets .......... do | ---------- | ---------- | ---------- | ---------- | 25,000 | 3,750 |
| Swordfish, fresh steaks .......... do | ---------- | ---------- | ---------- | ---------- | 116,400 | 28,280 |
| Totuava, fresh steaks .......... do | ---------- | ---------- | ---------- | ---------- | 1,790,000 | 358,000 |
| Tuna and tunalike fishes: | | | | | | |
| Canned: | | | | | | |
| Albacore .......... standard cases | (1) | (1) | 43,834 | 281,247 | 324,184 | 1,928,556 |
| Bluefin .......... do | ---------- | ---------- | ---------- | ---------- | 312,748 | 1,580,114 |
| Bonito .......... do | ---------- | ---------- | ---------- | ---------- | 157,979 | 676,595 |
| Striped .......... do | ---------- | ---------- | ---------- | ---------- | 348,254 | 1,729,108 |
| Tonno .......... do | ---------- | ---------- | ---------- | ---------- | 140,400 | 946,725 |
| Yellowfin .......... do | ---------- | ---------- | ---------- | ---------- | 1,306,132 | 7,461,671 |
| Yellowtail .......... do | ---------- | ---------- | ---------- | ---------- | 83,819 | 363,908 |
| Meal .......... tons | ---------- | ---------- | (1) | (1) | 9,553 | 347,206 |
| Oil .......... gallons | ---------- | ---------- | (1) | (1) | 178,334 | 52,109 |
| Crabs: | | | | | | |
| Meat, packaged, fresh-cooked .......... pounds | 136,038 | 52,230 | 806,975 | 266,725 | ---------- | ---------- |
| Canned .......... standard cases | (1) | (1) | 3,138 | 68,949 | ---------- | ---------- |
| Abalone steaks .......... pounds | ---------- | ---------- | ---------- | ---------- | 429,343 | 151,666 |
| Clams, hard: | | | | | | |
| Fresh-shucked .......... gallons | 3,493 | 4,473 | ---------- | ---------- | ---------- | ---------- |
| Canned: | | | | | | |
| Whole .......... standard cases | 16,551 | 66,080 | ---------- | ---------- | ---------- | ---------- |
| Minced .......... do | 12,948 | 60,356 | ---------- | ---------- | ---------- | ---------- |
| Juice .......... do | 2,507 | 5,876 | ---------- | ---------- | ---------- | ---------- |
| Shells crushed for poultry feed .......... tons | 3,019 | 23,524 | ---------- | ---------- | ---------- | ---------- |
| Clams, razor, canned, whole and minced .......... standard cases | 53,439 | 438,041 | (1) | (1) | ---------- | ---------- |
| Oysters: | | | | | | |
| Pacific: | | | | | | |
| Fresh-shucked .......... gallons | 306,365 | 339,753 | 69,398 | 73,678 | (1) | (1) |
| Canned .......... standard cases | 105,672 | 437,157 | (1) | (1) | ---------- | ---------- |
| Western or native, fresh-shucked .......... gallons | 18,391 | 143,633 | 7,082 | 55,809 | (1) | (1) |
| Shell products: | | | | | | |
| Poultry feed .......... tons | 5,336 | 49,459 | (1) | (1) | 11,696 | 53,433 |
| Lime .......... do | 3,304 | 21,293 | ---------- | ---------- | (1) | (1) |
| Unclassified: | | | | | | |
| Packaged .......... pounds | [4] 156,225 | [4] 15,523 | (5) | (5) | (5) | (5) |
| Salted .......... do | [6] 138,885 | [6] 13,375 | (5) | (5) | [7] 662,906 | [7] 82,938 |
| Canned: | | | | | | |
| Cat and dog food .......... standard cases | ---------- | ---------- | ---------- | ---------- | 183,006 | 540,098 |
| Other .......... do | [8] 18,015 | [8] 127,563 | [9] 9,790 | [9] 68,897 | [10] 12,118 | [10] 61,318 |
| Meal .......... tons | [11] 798 | [11] 39,855 | (5) | (5) | [12] 2,427 | [12] 77,972 |
| Oil .......... gallons | [13] 151,927 | [13] 777,269 | (5) | (5) | [14] 138,878 | [14] 896,514 |
| Miscellaneous .......... | ---------- | [15] 13,771 | ---------- | [16] 71,696 | ---------- | [17] 532,074 |
| Total .......... | ---------- | 7,165,828 | ---------- | 4,728,182 | ---------- | 36,727,229 |

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[1] The production of this item has been included under "Unclassified products."

[4] Includes frozen fillets of flounders, halibut, and "lingcod"; fresh fillets of rockfishes; and fresh-shucked bay scallops.

[5] This item has been included with "Miscellaneous."

[6] Includes salted cod tongues, salmon bellies, and salmon eggs for caviar; and spiced sea herring.

[7] Includes dry salted barracuda, bonito, cod, mackerel, pilchards, black and white sea bass, tuna and yellowtail; salted, boneless, and absolutely boneless cod; and mild-cured shad.

[8] Includes canned albacore tuna, shad, crabs, hard clam chowder, and smoked Pacific oysters.

[9] Includes canned salmon eggs for bait, kippered sturgeon, razor clams, razor clam juice, Pacific oysters, and cat and dog food.

[10] Includes canned swordfish, tuna roe, squid, shore dinners, and salted cod.

[11] Includes salmon, salmon egg and shark meal.

[12] Includes shrimp, shark and miscellaneous fish meals; and miscellaneous green scrap.

[13] Includes salmon, shark, shark liver, tuna liver, halibut viscera, and miscellaneous liver oils.

[14] Includes shark body, shark liver, tuna liver, miscellaneous fish and miscellaneous fish liver oils.,

[15] Includes smoked sea herring bloaters, and clam-shell lime.

[16] Includes fresh fillets of flounders, "lingcod", and rockfishes; frozen fillets of salmon; frozen steaks of salmon; kippered salmon and sturgeon; salmon, salmon egg and tuna meals; tuna oil; and oyster-shell poultry feed.

[17] Includes fresh fillets of sablefish; fresh-shucked Pacific and native oysters; smoked barracuda, chubs, sea herring bloaters, mackerel, bonito, and yellowtail; sun-dried shrimp; marine-shell novelties; oyster-shell lime; kelp products, and liquid glue.

*Industries related to the fisheries of the Pacific Coast States, 1938*—Continued

PRODUCTS MANUFACTURED—Continued

| Item | Washington | | Oregon | | California | |
|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By fishermen: | | | | | | |
| Cod, green salted [2] pounds | 3,065,450 | $129,480 | | | | |
| Cod tongues, salted do | 14,325 | 1,340 | | | | |
| Crab meat, packaged, fresh-cooked pounds | | | 8,735 | $2,621 | | |
| Shrimp: | | | | | | |
| Sun-dried do | | | | | 86,634 | $12,129 |
| Bran tons | | | | | 80 | 1,600 |
| Clams, mixed, fresh-shucked gallons | | | 1,392 | 1,740 | | |
| Scallops, bay, fresh-shucked do | 872 | 1,962 | | | | |
| Total | | 132,782 | | 4,361 | | 13,729 |
| Grand total | | 7,298,610 | | 4,732,543 | | 36,740,958 |

[2] This item is usually an intermediate product and although included in the total, may be shown in its final stage of processing in this or another State.

NOTE.—The total value of manufactured products in the Pacific Coast States was as follows: By manufacturing establishments, $48,621,239; and by fishermen, $150,872. Some of the above products may have been imported from another State or foreign country; therefore, they cannot be correlated directly with the catch within the State. All of the persons engaged in the preparation of fishermen's manufactured products have also been included as fishermen.

## WASHINGTON

*Fisheries of Washington, 1938*

CATCH: BY DISTRICTS

| Species | Puget Sound district | | Coastal district | | Columbia River district | |
|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Carp | | | | | 90,800 | $2,724 |
| Cod [1] | 10,351,800 | $141,666 | | | | |
| Flounders: | | | | | | |
| "Sole" | 4,470,600 | 130.718 | 4,700 | $189 | 1,400 | 28 |
| Other | 556,300 | 13,982 | | | 40,200 | 402 |
| Grayfish | 578,100 | 4,153 | | | | |
| Halibut | 23,068,800 | 1,874,949 | 7,200 | 440 | 8,600 | 555 |
| Herring | 341,400 | 3,824 | | | | |
| "Lingcod" | 2,816,900 | 69,933 | 74,100 | 1,152 | 2,700 | 62 |
| Perch | 152,800 | 4,966 | | | | |
| Pilchard or sardine | 10,300 | 582 | 52,965,800 | 291,312 | | |
| Rockfishes | 704,500 | 29,745 | 7,100 | 124 | 11,200 | 202 |
| Sablefish | 2,715,200 | 111,960 | 700 | 14 | 53,000 | 1,633 |
| Salmon: | | | | | | |
| Blueback, red, or sockeye | 9,865,300 | 723,127 | 601,000 | 70,918 | 132,400 | 15,888 |
| Chinook or king | 4,339,900 | 478,501 | 1,827,500 | 165,227 | 3,321,200 | 290,939 |
| Chum or keta | 8,248,200 | 206,204 | 1,323,200 | 27,419 | 781,600 | 7,816 |
| Humpback or pink | 39,500 | 1,185 | | | | |
| Silver or coho | 5,798,500 | 392,067 | 1,691,600 | 89,207 | 1,611,800 | 86,654 |
| Shad | | | | | 52,700 | 1,749 |
| Smelt: | | | | | | |
| Eulachon | | | | | 2,556,900 | 65,920 |
| Surf or silver | 180,500 | 12,039 | 258,100 | 9,016 | | |
| Steelhead trout | | | 36,000 | 3,600 | 367,800 | 22,068 |
| Sturgeon | | | 12,000 | 1,080 | 31,600 | 575 |
| Tuna, albacore | 1,192,100 | 53,559 | 2,251,600 | 101,132 | 689,100 | 31,285 |
| Total | 75.440.700 | 4,253,160 | 61,060,600 | 760,830 | 9,753,000 | 528,500 |
| SHELLFISH, ETC. | | | | | | |
| Crabs | 512,400 | 15,026 | 2,100,200 | 101,650 | | |
| Shrimp | 25,100 | 3,622 | | | | |
| Clams: | | | | | | |
| Hard: | | | | | | |
| Butter | 421,300 | 26,963 | | | | |
| Little neck | 441,300 | 39,717 | | | | |
| Razor | | | 1,125,100 | 187,512 | | |
| Octopus | 64,200 | 3,007 | | | | |
| Oysters, market: | | | | | | |
| Pacific | 894,000 | 67,052 | 7,484,300 | 456,165 | | |
| Western or native | 261,300 | 181,804 | 900 | 495 | | |
| Scallops, bay | 20,400 | 5,147 | | | | |
| Squid | 15,600 | 998 | | | | |
| Trepang | 10,600 | 530 | | | | |
| Total | 2,666,200 | 343,866 | 10,710,500 | 745,822 | | |
| Grand total | 78,106,900 | 4,597,026 | 71,771,100 | 1,506,652 | 9,753,000 | 528,500 |

[1] Nearly all of the cod were taken off Alaska.

## *Fisheries of the Puget Sound district of Washington, 1938*

### OPERATING UNITS: By gear

| Item | Purse seines | | Haul seines | Gill nets | | Lines | | Pound nets [2] | Brush weirs |
|---|---|---|---|---|---|---|---|---|---|
| | Salmon | Pilchard or sardine [1] | | Drift | Set [2] | Trawl, set, and hand | Troll | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 1, 724 | 485 | 44 | | | 1, 227 | 312 | | |
| On boats and shore | 52 | | 408 | 484 | 5 | 305 | 124 | 4 | 4 |
| Total | 1, 776 | 485 | 452 | 484 | 5 | 1, 532 | 436 | 4 | 4 |
| Vessels: | | | | | | | | | |
| Motor | 216 | 46 | 11 | | | 147 | 166 | | |
| Net tonnage | 4, 732 | 2, 263 | 68 | | | 4, 272 | 1, 264 | | |
| Sail | | | | | | 3 | | | |
| Net tonnage | | | | | | 1, 421 | | | |
| Total vessels | 216 | 46 | 11 | | | 150 | 166 | | |
| Total net tonnage | 4, 732 | 2, 763 | 68 | | | 5, 693 | 1, 264 | | |
| Boats: | | | | | | | | | |
| Motor | 13 | | 114 | 452 | 5 | 80 | 83 | 2 | 2 |
| Other | | | 63 | | | 141 | | | 2 |
| Accessory boats | 229 | 46 | | | | 62 | | | |
| Apparatus: | | | | | | | | | |
| Number | 229 | 46 | 177 | 452 | 5 | 26, 655 | 1, 245 | 2 | 4 |
| Length, yards | 125, 950 | 18, 390 | 13, 008 | | | | | | |
| Square yards | | | | 682, 520 | 1, 200 | | | | |
| Hooks | | | | | | 587, 283 | 5, 503 | | |

| Item | Dip nets | Reef nets | Beam trawls | Otter trawls | Traps | | Tongs and rakes, oyster | Shovels | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Crab | Octopus | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | 15 | 190 | 2 | | | | 3, 547 |
| On boats and shore | 14 | 296 | 9 | 9 | 81 | 15 | 149 | 476 | 2, 130 |
| Total | 14 | 296 | 24 | 199 | 83 | 15 | 149 | 476 | 5, 677 |
| Vessels: | | | | | | | | | |
| Motor | | | 5 | 58 | 1 | | | | 573 |
| Net tonnage | | | 43 | 1, 057 | 9 | | | | 12, 002 |
| Sail | | | | | | | | | 3 |
| Net tonnage | | | | | | | | | 1, 421 |
| Total vessels | | | 5 | 58 | 1 | | | | 576 |
| Total net tonnage | | | 43 | 1, 057 | 9 | | | | 13, 423 |
| Boats: | | | | | | | | | |
| Motor | 14 | | 3 | 3 | 67 | 10 | 37 | | 769 |
| Other | | 148 | | | 14 | 5 | 105 | | 444 |
| Accessory boats | | | | | | | | | 321 |
| Apparatus: | | | | | | | | | |
| Number | 14 | 74 | 8 | 61 | 2, 673 | 270 | 149 | 476 | |
| Yards at mouth | | | 53 | 915 | | | | | |

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[1] Operated in the Washington coast, Oregon, and California pilchard or sardine fishery. See separate sections for catch statistics. Of the total vessels, 15 operated in the pilchard or sardine fishery exclusively in California. These vessels also engaged in the halibut and salmon fisheries from Puget Sound earlier in the year. The remaining vessels operated in the Northwest pilchard or sardine fishery, as well as in California.

[2] Fished only on Indian reservations.

*Fisheries of the Puget Sound district of Washington, 1938*—Continued

CATCH: By gear

| Species | Purse seines | | Haul seines [1] | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Drift | | Set [2] | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod | | | 2,100 | $55 | | | | |
| Flounders, "sole" | 1,000 | $29 | 50,200 | 1,466 | | | | |
| Herring | 46,600 | 522 | 48,200 | 540 | | | | |
| "Lingcod" | 1,100 | 19 | 7,500 | 133 | 400 | $7 | | |
| Perch | | | 139,500 | 4,534 | | | | |
| Pilchard or sardine | | | 10,300 | 582 | | | | |
| Rockfishes | 700 | 17 | 19,600 | 470 | | | | |
| Salmon: [6] | | | | | | | | |
| Blueback, red, or sockeye | 9,152,700 | 670,893 | 300 | 22 | 540,700 | 39,633 | | |
| Chinook or king | 382,600 | 22,191 | 6,800 | 476 | 924,100 | 64,687 | 9,400 | $658 |
| Chum or keta | 7,030,000 | 175,750 | 10,000 | 250 | 712,700 | 17,818 | 400,100 | 10,002 |
| Humpback or pink | 17,400 | 522 | | | 21,700 | 651 | | |
| Silver or coho | 1,500,300 | 82,516 | 4,700 | 282 | 1,418,000 | 85,080 | 10,100 | 606 |
| Smelt, surf or silver | | | 177,300 | 11,826 | | | | |
| Total | 18,132,400 | 952,459 | 476,500 | 20,636 | 3,617,600 | 207,876 | 419,600 | 11,266 |
| SHELLFISH, ETC. | | | | | | | | |
| Octopus | | | 100 | 4 | | | | |
| Squid | | | 15,600 | 998 | | | | |
| Trepang | | | 10,600 | 530 | | | | |
| Total | | | 26,300 | 1,532 | | | | |
| Grand total | 18,132,400 | 952,459 | 502,800 | 22,168 | 3,617,600 | 207,876 | 419,600 | 11,266 |

| Species | Lines | | | | Pound nets [3] | | Brush weirs | |
|---|---|---|---|---|---|---|---|---|
| | Trawl, set and hand [3] | | Troll | | | | | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod | [4] 9,888,500 | $129,480 | | | | | | |
| Flounders, "sole" | 100 | 3 | | | | | | |
| Grayfish | [5] 558,900 | 3,980 | | | | | | |
| Halibut | 22,931,200 | 1,866,144 | 114,500 | $7,607 | | | | |
| Herring | | | | | | | 245,100 | $2,745 |
| "Lingcod" | 2,319,800 | 57,743 | 173,200 | 3,389 | | | | |
| Rockfishes | 403,900 | 20,775 | 1,100 | 23 | | | | |
| Sablefish | 2,685,100 | 111,391 | | | | | | |
| Salmon: [6] | | | | | | | | |
| Blueback, red, or sockeye | | | 600 | 45 | | | | |
| Chinook or king | | | 2,896,300 | 382,312 | 98,000 | $6,860 | | |
| Chum or keta | | | 100 | 2 | 18,000 | 450 | | |
| Silver or coho | | | 2,595,100 | 208,392 | 64,900 | 3,894 | | |
| Tuna, albacore | | | 1,192,100 | 53,559 | | | | |
| Total | 38,787,500 | 2,189,516 | 6,973,000 | 655,329 | 180,900 | 11,204 | 245,100 | 2,745 |

See footnotes at end of table.

## *Fisheries of the Puget Sound district of Washington, 1938*—Continued

### CATCH: BY GEAR—Continued

| Species | Dip nets | | Reef nets | | Beam trawls | | Otter trawls | |
|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod | | | | | | | 461,200 | $12,131 |
| Flounders: | | | | | | | | |
| "Sole" | | | | | | | 4,419,300 | 129,220 |
| Other | | | | | | | 566,300 | 13,982 |
| Grayfish | | | | | | | 19,200 | 173 |
| Halibut | | | | | | | 23,100 | 1,198 |
| Herring | 1,500 | $17 | | | | | | |
| "Lingcod" | | | | | | | 314,900 | 8,642 |
| Perch | | | | | | | 13,300 | 432 |
| Rockfishes | | | | | | | 279,200 | 8,460 |
| Sablefish | | | | | | | 30,100 | 569 |
| Salmon:[6] | | | | | | | | |
| Blueback, red, or sockeye | | | 171,000 | $12,534 | | | | |
| Chinook or king | | | 22,700 | 1,317 | | | | |
| Chum or keta | | | 77,300 | 1,932 | | | | |
| Humpback or pink | | | 400 | 12 | | | | |
| Silver or coho | | | 205,400 | 11,297 | | | | |
| Smelt, surf or silver | 3,200 | 213 | | | | | | |
| Total | 4,700 | 230 | 476,800 | 27,092 | | | 6,126,600 | 174,807 |
| SHELLFISH, ETC. | | | | | | | | |
| Shrimp | | | | | 25,100 | $3,622 | | |
| Octopus | | | | | | | 2,200 | 88 |
| Scallops, bay[10] | | | | | 20,400 | 5,147 | | |
| Total | | | | | 45,500 | 8,769 | 2,200 | 88 |
| Grand total | 4,700 | 230 | 476,800 | 27,092 | 45,500 | 8,769 | 6,128,800 | 174,895 |

| SPECIES | Traps | | | | Tongs and rakes | | Shovels | |
|---|---|---|---|---|---|---|---|---|
| | Crab | | Octopus | | | | | |
| SHELLFISH, ETC. | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs[7] | 512,400 | $15,026 | | | | | | |
| Clams, hard:[8] | | | | | | | | |
| Butter | | | | | | | 421,300 | $26,963 |
| Little neck | | | | | | | 441,300 | 39,717 |
| Octopus | | | 61,900 | $2,915 | | | | |
| Oysters, market:[9] | | | | | | | | |
| Pacific | | | | | 894,000 | $67,052 | | |
| Western or native | | | | | 261,300 | 181,804 | | |
| Total | 512,400 | 15,026 | 61,900 | 2,915 | 1,155,300 | 248,856 | 862,600 | 66,680 |

[1] Includes the catch of smelt by drag bag nets.

[2] Fished only on Indian reservations.

[3] In addition, vessels in the Pacific coast halibut fleet landed approximately 540,000 pounds of halibut, sablefish, and "lingcod" livers at Seattle, valued at $250,600. Vessels of the halibut fleet also landed 606,164 pounds of halibut and sablefish viscera, valued at $60,616.

[4] Most of the cod were taken off Alaska.

[5] Caught almost entirely for the utilization of the livers for dogfish oil. Most of the fish carcasses were discarded.

[6] Statistics on the catch of salmon except those taken by troll lines, are reported to the State in number rather than pounds. The factors used in the above table for converting number of salmon to weight in pounds were as follows: Blueback, red, or sockeye, 7 pounds; chinook or king, 24.9 pounds; chum or keta, 10 pounds; humpback or pink, 5 pounds; and silver or coho, 9.9 pounds.

[7] The weight of crabs shown is based on an average of 20 pounds per dozen.

[8] Statistics on hard clams are based on yields of 28 percent edible meats for butter clams and 24 percent for little neck clams.

[9] Statistics on oysters shown are based on yields of 18 percent edible meats for native oysters and 10 percent for Pacific oysters.

[10] The weight of bay scallops is based on a yield of 17 percent edible meat.

NOTE.—The catch of salmon by haul seines was made by Indians on their reservations.

## *Fisheries of the coastal district of Washington, 1938*

### OPERATING UNITS: BY GEAR [1]

| Item | Haul seines | Gill nets | | Lines, troll | Dip nets | Traps, crab | Tongs and rakes, oyster | Dredges, oyster | Shovels | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Drift | Set [2] | | | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | 95 | | 6 | | 8 | | 103 |
| On boats and shore | 22 | 263 | 120 | 162 | 76 | 58 | 253 | | 4,453 | 5,134 |
| Total | 22 | 263 | 120 | 257 | 76 | 64 | 253 | 8 | 4,453 | 5,237 |
| Vessels, motor | | | | 70 | | 3 | | 2 | | 72 |
| Net tonnage | | | | 552 | | 29 | | 13 | | 565 |
| Boats: | | | | | | | | | | |
| Motor | | 217 | 35 | 139 | | 46 | 71 | | | 466 |
| Other | 4 | | 80 | | 14 | | 157 | 2 | | 243 |
| Apparatus: | | | | | | | | | | |
| Number | 4 | 217 | 120 | 1,045 | 76 | 3,185 | 220 | 4 | 4,453 | |
| Length, yards | 280 | | | | | | | | | |
| Square yards | | 418,376 | 26,500 | | | | | | | |
| Yards at mouth | | | | | | | | 8 | | |
| Hooks | | | | 4,702 | | | | | | |

[1] In addition a combined fleet of 48 Puget Sound, Oregon, and California purse seine vessels operated in the Washington coast pilchard fishery. These vessels were manned by a total of 491 fishermen and had an aggregate capacity of 2,954 net tons. Of the total vessels 26 were from Puget Sound, 1 from Oregon, and 21 from California. Twenty-one of these vessels were duplicated in the Oregon coast pilchard fishery. For detailed statistics regarding the operating units in this fishery, refer to the gear tables in the Puget Sound, Oregon and California sections of this report.

[2] Fished by Indians on reservations.

### CATCH: BY GEAR

| Species | Purse seines | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Drift | | Set [1] | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Pilchard or sardine | 52,965,800 | $291,312 | | | | | | |
| Salmon: [2] | | | | | | | | |
| Blueback, red, or sockeye | | | | | | | 601,000 | $70,918 |
| Chinook or king | | | | | 652,800 | $30,029 | 159,900 | 4,797 |
| Chum or keta | | | | | 955,400 | 20,063 | 367,800 | 7,356 |
| Silver or coho | | | | | 582,600 | 29,130 | 440,200 | 17,608 |
| Smelt, surf or silver | | | 26,200 | $1,572 | | | | |
| Steelhead trout [3] | | | | | | | 36,000 | 3,600 |
| Sturgeon | | | | | 12,000 | 1,080 | | |
| Total | 52,965,800 | 291,312 | 26,200 | 1,572 | 2,202,800 | 80,302 | 1,604,900 | 104,279 |

| Species | Lines, troll | | Dip nets | | Otter trawls | |
|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders, "sole" | 100 | $4 | | | 4,600 | $185 |
| Halibut | 7,200 | 440 | | | | |
| "Lingcod" | 74,100 | 1,152 | | | | |
| Rockfishes | 7,100 | 121 | | | | |
| Sablefish | | | | | 700 | 14 |
| Salmon: [2] | | | | | | |
| Chinook or king | 1,014,800 | 130,401 | | | | |
| Silver or coho | 668,800 | 42,469 | | | | |
| Smelt, surf or silver | | | 231,900 | $7,444 | | |
| Tuna, albacore | 2,251,600 | 101,132 | | | | |
| Total | 4,023,700 | 275,722 | 231,900 | 7,444 | 5,300 | 199 |

[1] Fished by Indians on their reservations.

[2] Statistics on the catch of salmon except those taken by troll lines are reported to the State in number rather than pounds. The factors used in the above table for converting number of salmon to weight in pounds were as follows: Blueback, red, or sockeye, 5 pounds; chinook or king, 22.53 pounds; chum or keta, 11.13 pounds; silver or coho, 11.06 pounds; and steelhead trout, 9 pounds.

[3] Steelhead trout shown in this table were taken on Indian reservations.

## *Fisheries of the coastal district of Washington, 1938*—Continued

### CATCH: BY GEAR—Continued

| Species | Traps | | Dredges, tongs, and rakes | | Shovels | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| SHELLFISH | | | | | | |
| Crabs [4] | 2, 100, 200 | $101, 650 | | | | |
| Clams, razor [5] | | | | | 1, 125, 100 | $187, 512 |
| Oysters, market: [6] | | | | | | |
| Pacific | | | 7, 484, 300 | $456, 165 | | |
| Western or native | | | 900 | 495 | | |
| Total | 2, 100, 200 | 101, 650 | 7, 485, 200 | 456, 660 | 1, 125, 100 | 187, 512 |

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[4] The weight of crabs shown is based on an average of 22 pounds per dozen.

[5] The weight of razor clams shown is in pounds of edible meats, based on a yield of 42 percent of the round weight.

[6] The statistics on oysters used in this table are based on a yield of 12 percent of edible meats from Pacific and native oysters.

NOTE.—The catch by otter trawls was made by fishermen from the Puget Sound district.

## *Fisheries of the Columbia River district of Washington, 1938*

### OPERATING UNITS: BY GEAR

| Item | Haul seines | Gill nets, drift | Lines | | Dip nets | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| | | | Trawl and set | Troll | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | 4 | 17 | | 21 |
| On boats and shore | 9 | 633 | 106 | 90 | 287 | 1, 015 |
| Total | 9 | 633 | 110 | 107 | 287 | 1, 036 |
| Vessels, motor | | | 1 | 12 | | 13 |
| Net tonnage | | | 7 | 85 | | 92 |
| Boats: | | | | | | |
| Motor | 3 | 474 | 85 | 68 | 143 | 721 |
| Other | 3 | | 21 | | 9 | 33 |
| Apparatus: | | | | | | |
| Number | 3 | 474 | 369 | 400 | 287 | |
| Length, yards | 500 | | | | | |
| Square yards | | 1, 312, 032 | | | | |
| Hooks | | | 28, 290 | 1, 768 | | |

### CATCH: BY GEAR

| Species | Haul seines | | Gill nets, drift | | Lines | | | | Dip nets | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Trawl and set | | Troll | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Carp | 90, 800 | $2, 724 | | | | | | | | |
| Flounders: | | | | | | | | | | |
| "Sole" | | | | | 1, 400 | $28 | | | | |
| Other | | | 40, 200 | $402 | | | | | | |
| Halibut | | | | | 8, 600 | 555 | | | | |
| "Lingcod" | | | | | 2, 700 | 62 | | | | |
| Rockfishes | | | 5, 200 | 52 | 6, 000 | 150 | | | | |
| Sablefish | | | | | 53, 000 | 1, 633 | | | | |
| Salmon: | | | | | | | | | | |
| Blueback, red, or sockeye | | | 92, 200 | 11, 064 | | | | | 40, 200 | $4, 824 |
| Chinook or king | | | 2, 995, 000 | 260, 565 | | | 116, 700 | $12, 148 | 209, 500 | 18, 226 |
| Chum or keta | | | 781, 600 | 7, 816 | | | | | | |
| Silver or coho | | | 741, 800 | 30, 191 | | | 870, 000 | 56, 463 | | |
| Shad | | | 51, 000 | 1, 693 | | | | | 1, 700 | 56 |
| Smelt, eulachon | | | 184, 400 | 12, 539 | | | | | 2, 372, 500 | 53, 381 |
| Steelhead trout | | | 324, 200 | 19, 452 | | | 100 | 6 | 43, 500 | 2, 610 |
| Sturgeon | | | 13, 300 | 242 | 18, 300 | 333 | | | | |
| Tuna, albacore | | | | | | | 689, 100 | 31, 285 | | |
| Total | 90, 800 | 2, 724 | 5, 228, 900 | 344, 016 | 90, 000 | 2, 761 | 1, 675, 900 | 99, 902 | 2, 267, 400 | 79, 097 |

## OREGON

### *Fisheries of Oregon, 1938*

CATCH: BY DISTRICTS

| Species | Columbia River district | | Coastal district | |
|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* |
| FISH | | | | |
| Flounders: | | | | |
| "Sole" | 19, 100 | $473 | 13, 700 | $714 |
| Other | 177, 800 | 1, 778 | 7, 400 | 185 |
| Halibut | 317, 900 | 21, 795 | 91, 400 | 5, 531 |
| Herring | | | 25, 500 | 383 |
| "Lingcod" | 177, 700 | 4, 703 | 92, 600 | 2, 344 |
| Perch | | | 4, 200 | 92 |
| Pilchard or sardine | | | 34, 035, 700 | 187, 196 |
| Rockfishes | 130, 400 | 2, 772 | 9, 300 | 246 |
| Sablefish | 124, 300 | 3, 776 | 100 | 2 |
| Salmon: | | | | |
| Blueback, red, or sockeye | 292, 700 | 35, 124 | | |
| Chinook or king | 9, 468, 000 | 826, 916 | 1, 570, 600 | 136, 645 |
| Chum or keta | 1, 133, 900 | 11, 339 | 843, 800 | 12, 657 |
| Silver or coho | 2, 907, 000 | 150, 849 | 4, 605, 800 | 211, 204 |
| Shad | 118, 600 | 3, 934 | 288, 100 | 12, 100 |
| Smelt: | | | | |
| Eulachon | 527, 300 | 35, 856 | | |
| Other | | | 1, 000 | 35 |
| Steelhead trout | 1, 639, 700 | 98, 323 | 220, 500 | 15, 876 |
| Striped bass | | | 44, 100 | 2, 192 |
| Sturgeon | 65, 800 | 1, 199 | 2, 800 | 56 |
| Tuna, albacore | 5, 162, 600 | 234, 382 | 706, 300 | 33, 902 |
| Total | 22, 262, 800 | 1, 433, 219 | 42, 562, 900 | 621, 360 |
| SHELLFISH | | | | |
| Crabs | | | 6, 408, 800 | 291, 311 |
| Crawfish, fresh-water | 93, 700 | 8, 435 | | |
| Clams: | | | | |
| Razor | | | 103, 300 | 24, 595 |
| Mixed | | | 92, 700 | 7, 961 |
| Oysters, market: | | | | |
| Pacific | | | 195, 100 | 8, 240 |
| Western or native | | | 8, 700 | 4, 464 |
| Total | 93, 700 | 8, 435 | 6, 808, 600 | 336, 571 |
| Grand total | 22, 356, 500 | 1, 441, 654 | 49, 371, 500 | 957, 931 |

### *Fisheries of the Columbia River district of Oregon, 1938*

OPERATING UNITS: BY GEAR

| Item | Purse seines, pilchard | Haul seines | Gill nets | | Lines | | Pound nets | Dip nets | Traps, crawfish | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Drift, salmon | Set, salmon | Trawl and set | Troll | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | | |
| On vessels | 10 | | | | 36 | 84 | | | | 110 |
| On boats and shore | | 360 | 1, 037 | 87 | 86 | 192 | 53 | 144 | 31 | 1, 900 |
| Total | 10 | 360 | 1, 037 | 87 | 122 | 276 | 53 | 144 | 31 | 2, 010 |
| Vessels, motor | 1 | | | | 9 | 53 | | | | 58 |
| Net tonnage | 71 | | | | 103 | 393 | | | | 523 |
| Boats: | | | | | | | | | | |
| Motor | | 16 | 719 | 78 | 74 | 140 | 25 | | 21 | 1, 023 |
| Other | | 31 | | 9 | 8 | | 25 | | 9 | 74 |
| Accessory boats | 1 | | | | | | | | | 1 |
| Apparatus: | | | | | | | | | | |
| Number | 1 | 31 | 719 | 153 | 1, 153 | 965 | 32 | 144 | 1, 395 | |
| Length, yards | 460 | 17, 393 | | | | | | | | |
| Square yards | | | 2,291,094 | 42, 840 | | | | | | |
| Hooks | | | | | 28, 790 | 4, 265 | | | | |

*Fisheries of the Columbia River district of Oregon, 1938*—Continued

CATCH: BY GEAR[1]

| Species | Haul seines | | Gill nets | | | | Lines | |
|---|---|---|---|---|---|---|---|---|
| | | | Drift | | Set | | Trawl and set | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders: | | | | | | | | |
| "Sole" | | | | | | | 19,000 | $471 |
| Other | | | 166,400 | $1,664 | | | | |
| Halibut | | | | | | | 314,400 | 21,569 |
| "Lingcod" | | | | | | | 137,900 | 4,132 |
| Rockfishes | | | | | | | 53,800 | 1,684 |
| Sablefish | | | | | | | 124,300 | 3,776 |
| Salmon: | | | | | | | | |
| Blueback, red, or sockeye | 46,700 | $5,604 | 179,100 | 21,492 | 8,100 | $972 | | |
| Chinook or king | 1,784,400 | 155,243 | 5,971,100 | 519,486 | 31,500 | 2,740 | 100 | 10 |
| Chum or keta | 124,000 | 1,240 | 941,500 | 9,415 | 6,100 | 61 | | |
| Silver or coho | 154,500 | 6,288 | 1,192,100 | 48,518 | 4,400 | 179 | | |
| Shad | 43,700 | 1,451 | 74,500 | 2,473 | 100 | 3 | | |
| Smelt, eulachon | | | 527,300 | 35,856 | | | | |
| Steelhead trout | 514,700 | 30,882 | 698,000 | 41,880 | 10,800 | 648 | | |
| Sturgeon | 1,200 | 22 | 32,500 | 592 | 9,100 | 166 | 22,400 | 408 |
| Total | 2,669,200 | 200,730 | 9,782,500 | 681,376 | 70,100 | 4,769 | 671,900 | 32,050 |

| Species | Lines | | Pound nets | | Dip nets | | Traps | |
|---|---|---|---|---|---|---|---|---|
| | Troll | | | | | | | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders: | | | | | | | | |
| "Sole" | 100 | $2 | | | | | | |
| Other | 700 | 7 | 10,700 | $107 | | | | |
| Halibut | 3,500 | 226 | | | | | | |
| "Lingcod" | 39,800 | 571 | | | | | | |
| Rockfishes | 44,400 | 551 | 32,200 | 537 | | | | |
| Salmon: | | | | | | | | |
| Blueback, red, or sockeye | | | 12,400 | 1,488 | 46,400 | $5,568 | | |
| Chinook or king | 187,000 | 19,467 | 391,400 | 34,052 | 1,102,500 | 95,918 | | |
| Chum or keta | | | 57,200 | 572 | 5,100 | 51 | | |
| Silver or coho | 1,342,200 | 87,162 | 213,800 | 8,702 | | | | |
| Shad | | | 300 | 7 | | | | |
| Steelhead trout | 500 | 30 | 196,100 | 11,707 | 219,600 | 13,176 | | |
| Sturgeon | | | 400 | 7 | 200 | 4 | | |
| Tuna, albacore | 5,162,600 | 234,382 | | | | | | |
| Total | 6,780,800 | 342,398 | 914,500 | 57,179 | 1,373,800 | 114,717 | | |
| SHELLFISH | | | | | | | | |
| Crawfish, fresh-water | | | | | | | 93,700 | $8,435 |
| Grand total | 6,780,800 | 342,398 | 914,500 | 57,179 | 1,373,800 | 114,717 | 93,700 | 8,435 |

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[1] Of the above species the following were taken off the Oregon and Washington coasts but landed in the Columbia River district: "Sole," halibut, "lingcod", rockfishes, sablefish, and tuna. Most of the troll-caught salmon were also taken in coastal waters.

## *Fisheries of the coastal district of Oregon, 1938*

### OPERATING UNITS: BY GEAR

| Item | Purse[1] seines, pilchard or sardine | Haul seines | Gill nets |  | Lines |  | Otter trawls | Traps, crab | Tongs and rakes, oyster | Shovels | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  | Drift | Set | Trawl and set | Troll |  |  |  |  |  |
|  | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: |  |  |  |  |  |  |  |  |  |  |  |
| On vessels | 12 |  |  |  | 8 | 55 | 3 | 38 |  |  | 91 |
| On boats and shore |  | 24 | 502 | 296 | 39 | 117 |  | 292 | 23 | 276 | 1,440 |
| Total | 12 | 24 | 502 | 296 | 47 | 172 | 3 | 330 | 23 | 276 | 1,531 |
| Vessels, motor | 1 |  |  |  | 2 | 21 | 1 | 19 |  |  | 30 |
| Net tonnage | 104 |  |  |  | 24 | 198 | 15 | 173 |  |  | 381 |
| Boats: |  |  |  |  |  |  |  |  |  |  |  |
| Motor |  | 8 | 437 | 189 | 35 | 108 |  | 286 | 6 |  | 947 |
| Other |  | 8 |  | 77 |  |  |  |  | 9 | 28 | 114 |
| Accessory boats | 1 |  |  |  |  |  |  |  |  |  | 1 |
| Apparatus: |  |  |  |  |  |  |  |  |  |  |  |
| Number | 1 | 8 | 437 | 859 | 361 | 650 | 1 | 19,825 | 23 | 276 |  |
| Length, yards | 470 | 1,336 |  |  |  |  |  |  |  |  |  |
| Square yards |  |  | 615,733 | 309,240 |  |  |  |  |  |  |  |
| Yards at mouth |  |  |  |  |  |  | 20 |  |  |  |  |
| Hooks |  |  |  |  | 9,860 | 2,815 |  |  |  |  |  |

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[1] In addition there was a combined fleet of 37 Washington, Columbia River district of Oregon, and California purse seine vessels operated in the Oregon Coast pilchard or sardine fishery. These vessels were manned by a total crew of 357 fishermen and had an aggregate tonnage of 2,274 net tons. Of the total vessels, 1 was from the Columbia River district of Oregon, 16 from Washington, and 20 from California. 21 of these craft were duplicated in the Washington Coast pilchard fishery. For detailed statistics regarding the operating units in this fishery, refer to the gear tables in the Oregon Columbia River, Washington, and California sections of this report.

### CATCH: BY GEAR

| Species | Purse seines, pilchard[1] |  | Haul seines |  | Gill nets, drift and set |  | Lines |  |
|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  | Trawl and set |  |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders: |  |  |  |  |  |  |  |  |
| "Sole" |  |  |  |  |  |  | 700 | $21 |
| Other |  |  | 4,500 | $112 | 2,900 | $73 |  |  |
| Halibut |  |  |  |  |  |  | 81,000 | 4,908 |
| Herring |  |  | 25,500 | 383 |  |  |  |  |
| 'Lingcod" |  |  |  |  |  |  | 34,500 | 925 |
| Perch |  |  | 4,200 | 92 |  |  |  |  |
| Pilchard or sardine | 34,035,700 | $187,196 |  |  |  |  |  |  |
| Rockfishes |  |  |  |  |  |  | 8,300 | 217 |
| Sablefish |  |  |  |  |  |  | 100 | 2 |
| Salmon: |  |  |  |  |  |  |  |  |
| Chinook or king |  |  |  |  | 1,019,300 | 73,797 |  |  |
| Chum or keta |  |  |  |  | 843,800 | 12,657 |  |  |
| Silver or coho |  |  |  |  | 3,257,200 | 130,288 |  |  |
| Shad |  |  |  |  | 288,100 | 12,100 |  |  |
| Smelts |  |  |  |  | 1,000 | 35 |  |  |
| Steelhead trout |  |  |  |  | 220,500 | 15,876 |  |  |
| Striped bass |  |  |  |  | 44,100 | 2,192 |  |  |
| Sturgeon |  |  |  |  | 2,800 | 56 |  |  |
| Total | 34,035,700 | 187,196 | 34,200 | 587 | 5,679,700 | 247,074 | 124,600 | 6,073 |

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[1] The Oregon coast pilchard fishery was prosecuted almost entirely by Washington and California purse-seine vessels. See separate sections for data on operating units in this fishery.

### *Fisheries of the coastal district of Oregon, 1938*—Continued

CATCH: BY GEAR—Continued

| Species | Lines—Contd. |  | Otter trawls |  | Traps |  | Tongs and rakes |  | Shovels |  |
|---|---|---|---|---|---|---|---|---|---|---|
|  | Troll |  |  |  |  |  |  |  |  |  |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders, "sole" |  |  | 13,000 | $693 |  |  |  |  |  |  |
| Halibut | 10,400 | $623 |  |  |  |  |  |  |  |  |
| "Lingcod" | 58,100 | 1,419 |  |  |  |  |  |  |  |  |
| Rockfishes | 1,000 | 29 |  |  |  |  |  |  |  |  |
| Salmon: |  |  |  |  |  |  |  |  |  |  |
| Chinook or king | 551,300 | 62,848 |  |  |  |  |  |  |  |  |
| Silver or coho | 1,348,600 | 80,916 |  |  |  |  |  |  |  |  |
| Tuna, albacore | 706,300 | 33,902 |  |  |  |  |  |  |  |  |
| Total | 2,675,700 | 179,737 | 13,000 | 693 |  |  |  |  |  |  |
| SHELLFISH |  |  |  |  |  |  |  |  |  |  |
| Crabs |  |  |  |  | 6,408,800 | $291,311 |  |  |  |  |
| Clams: |  |  |  |  |  |  |  |  |  |  |
| Razor [2] |  |  |  |  |  |  |  |  | 103,300 | $24,595 |
| Mixed [3] |  |  |  |  |  |  |  |  | 92,700 | 7,961 |
| Oysters, market: [4] |  |  |  |  |  |  |  |  |  |  |
| Pacific |  |  |  |  |  |  | 195,100 | $8,240 |  |  |
| Western or native |  |  |  |  |  |  | 8,700 | 4,464 |  |  |
| Total |  |  |  |  | 6,408,800 | 291,131 | 203,800 | 12,704 | 196,000 | 32,556 |
| Grand total | 2,675,700 | 179,737 | 13,000 | 693 | 6,408,800 | 291,311 | 203,800 | 12,701 | 196,000 | 32,556 |

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[2] The weight of razor clams is that of edible meats, based on a yield of 42 percent of the round weight.

[3] Mixed clams consist principally of Eastern soft-shell clams. The weight shown is that of edible meats, based on a yield of 21 percent of the round weight.

[4] Statistics on oysters used in this table are based on yields of 12 percent of edible meats for both Pacific and native oysters.

## CALIFORNIA

### *Fisheries of California, 1938*

CATCH: BY DISTRICTS

| Species | Northern district |  | San Francisco district |  | Monterey district |  |
|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Anchovies |  |  | 251,800 | $3,776 | 34,100 | $719 |
| Carp |  |  | 37,000 | 762 | 1,400 | 55 |
| Catfish |  |  | 312,200 | 40,530 | 100 | 7 |
| Flounders: |  |  |  |  |  |  |
| "California halibut" | 3,100 | $248 | 14,600 | 1,836 | 39,600 | 3,299 |
| "Sole" | 3,883,300 | 228,840 | 3,192,700 | 190,390 | 452,800 | 18,859 |
| Other | 505,900 | 22,537 | 686,200 | 30,751 | 69,400 | 3,425 |
| Hake | 1,700 | 17 | 18,000 | 180 | 16,400 | 164 |
| Halibut | 405,500 | 27,923 | 300 | 29 |  |  |
| Hardhead |  |  | 12,900 | 1,401 |  |  |
| Herring | 5,100 | 39 | 495,600 | 2,645 | 800 | 19 |
| Horse mackerel |  |  |  |  | 98,600 | 7,682 |
| Kingfish |  |  | 6,200 | 249 | 146,800 | 5,516 |
| "Lingcod" | 384,900 | 15,675 | 173,900 | 6,472 | 85,300 | 4,558 |
| Mackerel |  |  | 1,000 | 30 | 1,482,200 | 38,309 |
| Perch | 8,900 | 290 | 69,300 | 2,243 | 15,700 | 743 |
| Pilchard or sardines |  |  | 446,631,600 | 2,501,136 | 311,385,700 | 1,755,299 |
| Rockfishes | 548,400 | 21,321 | 560,400 | 29,948 | 1,852,600 | 75,204 |
| Sablefish | 217,400 | 11,129 | 8,500 | 199 | 38,400 | 939 |
| Salmon | 1,853,700 | 158,274 | 1,778,300 | 106,430 | 199,500 | 20,861 |
| Sea bass, white |  |  | 11,100 | 997 | 23,900 | 2,450 |
| Shad |  |  | 1,338,700 | 50,646 |  |  |
| Sharks, including grayfish | 140,400 | 2,092 | 4,318,800 | 69,517 | 1,769,800 | 33,330 |
| Skates | 60,000 | 601 | 329,400 | 3,294 | 92,600 | 490 |
| Smelt | 13,200 | 473 | 236,000 | 12,189 | 92,800 | 4,180 |
| Splittail |  |  | 11,100 | 398 |  |  |
| Squawfish |  |  | 1,000 | 37 |  |  |
| Suckers |  |  | 500 | 17 |  |  |

*Fisheries of California, 1938*—Continued

CATCH: BY DISTRICTS—Continued

| Species | Northern district | | San Francisco district | | Monterey district | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| FISH—continued | | | | | | |
| Tomcod | 2, 200 | $32 | 900 | $17 | | |
| Tuna, albacore | 22, 300 | 1, 539 | 7, 000 | 407 | 2, 591, 400 | $142, 068 |
| Whitebait | 96, 100 | 6, 076 | 8, 100 | 592 | 2, 500 | 241 |
| Other fish | 85, 400 | 1, 704 | 75, 600 | 1, 512 | 9, 000 | 344 |
| Total | 8, 237, 500 | 498, 810 | 460, 588, 700 | 3, 058, 630 | 320, 501, 400 | 2, 118, 761 |
| SHELLFISH | | | | | | |
| Crabs | 534, 500 | 30, 322 | 3, 171, 100 | 210, 778 | 168, 000 | 8, 612 |
| Shrimp | | | 1, 844, 100 | 36, 170 | 3, 300 | 671 |
| Abalone | | | | | 240, 800 | 56, 586 |
| Clams: | | | | | | |
| Hard | 5, 000 | 787 | 1, 600 | 381 | 200 | 40 |
| Pismo | | | | | 5, 000 | 1, 221 |
| Soft | 200 | 53 | 27, 700 | 5, 782 | | |
| Octopus | 1, 900 | 110 | 6, 200 | 337 | 24, 400 | 1, 647 |
| Oysters, market: | | | | | | |
| Eastern | 5, 100 | 1, 702 | 43, 100 | 15, 975 | | |
| Pacific | | | 156, 800 | 29, 400 | 1, 100 | 160 |
| Western or native | | | 3, 900 | 1, 288 | | |
| Squid | | | | | 1, 472, 000 | 31, 521 |
| Total | 546, 700 | 32, 974 | 5, 254, 500 | 300, 111 | 1, 914, 800 | 100, 458 |
| Grand total | 8, 784, 200 | 531, 784 | 465, 843, 200 | 3, 358, 741 | 322, 416, 200 | 2, 219, 219 |

| Species | San Pedro district | | | | | |
|---|---|---|---|---|---|---|
| | Off California | | Off Latin America | | Total | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| FISH | | | | | | |
| Anchovies | 449, 300 | $4, 811 | | | 449, 300 | $4, 811 |
| Barracuda | 897, 800 | 54, 519 | 774, 500 | $58, 629 | 1, 672, 300 | 113, 148 |
| Cabrilla | | | 84, 000 | 4, 575 | 84, 000 | 4, 575 |
| Carp | 500 | 30 | | | 500 | 30 |
| Flounders: | | | | | | |
| "California halibut" | 606, 500 | 50, 623 | 8, 500 | 909 | 615, 000 | 51, 532 |
| "Sole" | 208, 700 | 6, 349 | | | 208, 700 | 6, 349 |
| Other | 6, 500 | 1, 296 | | | 6, 500 | 1, 296 |
| Flyingfish | 62, 900 | 2, 337 | | | 62, 900 | 2, 337 |
| Groupers | | | 21, 500 | 1, 374 | 21, 500 | 1, 374 |
| Hake | 300 | 7 | | | 300 | 7 |
| Herring | 100 | 2 | | | 100 | 2 |
| Horse mackerel | 3, 954, 000 | 36, 891 | | | 3, 954, 000 | 36, 891 |
| Kingfish | 339, 500 | 7, 234 | | | 339, 500 | 7, 234 |
| "Lingcod" | 1, 900 | 103 | | | 1, 900 | 103 |
| Mackerel | 74, 007, 500 | 775, 182 | 300 | 5 | 74, 007, 800 | 775, 187 |
| Mullet | 300 | 26 | | | 300 | 26 |
| Perch | 61, 200 | 3, 738 | | | 61, 200 | 3, 738 |
| Pilchard or sardines | 259, 859, 200 | 1, 550, 300 | | | 259, 859, 200 | 1, 550, 300 |
| Pompano | 600 | 273 | | | 600 | 273 |
| Rock bass | 132, 100 | 9, 072 | 7, 300 | 435 | 139, 400 | 9, 507 |
| Rockfishes | 438, 400 | 19, 486 | 8, 600 | 415 | 447, 000 | 19, 901 |
| Rudderfishes | 27, 600 | 1, 482 | | | 27, 600 | 1, 482 |
| Sablefish | 151, 500 | 7, 133 | | | 151, 500 | 7, 133 |
| Salmon | 200 | 18 | | | 200 | 18 |
| Sculpin | 94, 100 | 7, 221 | | | 94, 100 | 7, 221 |
| Sea bass: | | | | | | |
| Black | 31, 000 | 1, 695 | 217, 800 | 13, 360 | 248, 800 | 15, 055 |
| White | 186, 200 | 19, 325 | 47, 600 | 3, 875 | 233, 800 | 23, 200 |
| Sharks, including grayfish | 1, 221, 500 | 31, 129 | 1, 400 | 52 | 1, 222, 900 | 31, 181 |
| Sheepshead | 58, 300 | 2, 284 | 800 | 29 | 59, 100 | 2, 313 |
| Skates | 45, 500 | 612 | | | 45, 500 | 612 |
| Smelt | 220, 200 | 9, 794 | | | 220, 200 | 9, 794 |
| Spanish mackerel | | | 7, 000 | 552 | 7, 000 | 552 |
| Swordfish | 266, 700 | 33, 461 | 38, 400 | 4, 022 | 305, 100 | 37, 483 |
| Tuna and tunalike fishes: | | | | | | |
| Albacore | 4, 160, 900 | 299, 511 | | | 4, 160, 900 | 299, 511 |
| Bluefin | 14, 541, 700 | 805, 575 | 527, 400 | 28, 009 | 15, 069, 100 | 833, 584 |
| Bonito | 2, 997, 400 | 112, 290 | 2, 651, 900 | 96, 558 | 5, 649, 300 | 208, 848 |
| Skipjack or striped tuna | 100 | 3 | 7, 783, 200 | 389, 163 | 7, 783, 300 | 389, 166 |
| Yellowfin | 3, 400 | 207 | 19, 513, 400 | 1, 172, 047 | 19, 516, 800 | 1, 172, 254 |
| Whitefish | 23, 200 | 1, 314 | 2, 600 | 142 | 25, 800 | 1, 456 |
| Yellowtail | 55, 600 | 2, 817 | 2, 288, 900 | 81, 583 | 2, 344, 500 | 84, 400 |
| Other fish | 113, 000 | 2, 518 | 1, 500 | 97 | 114, 500 | 2, 615 |
| Total | 365, 225, 400 | 3, 860, 668 | 33, 986, 600 | 1, 855, 831 | 399, 212, 000 | 5, 716, 499 |

## *Fisheries of California, 1938*—Continued

CATCH: BY DISTRICTS—Continued

| Species | San Pedro district | | | | | |
|---|---|---|---|---|---|---|
| | Off California | | Off Latin America | | Total | |
| SHELLFISH | *Pounds* | *Value* | *Ponuds* | *Value* | *Pounds* | *Value* |
| Crabs | 3,900 | $123 | | | 3,900 | $123 |
| Sea crawfish or spiny lobsters | 253,200 | 50,559 | | | 253,200 | 50,559 |
| Abalone | 183,500 | 35,393 | | | 183,500 | 35,393 |
| Clams: | | | | | | |
| Hard | 5,600 | 1,497 | | | 5,600 | 1,497 |
| Pismo | 48,600 | 10,170 | | | 48,600 | 10,170 |
| Octopus | 100 | 9 | | | 100 | 9 |
| Oysters, market, Pacific | 3,100 | 1,128 | | | 3,100 | 1,128 |
| Squid | 122,400 | 4,146 | | | 122,400 | 4,146 |
| Total | 620,400 | 103,025 | | | 620,400 | 103,025 |
| Grand total | 365,845,800 | 3,963,693 | 33,986,600 | $1,855,831 | 399,832,400 | 5,819,524 |

| Species | San Diego district | | | | | |
|---|---|---|---|---|---|---|
| | Off California | | Off Latin America | | Total | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Barracuda | 363,000 | $15,085 | 494,200 | $30,444 | 857,200 | $45,529 |
| Cabrilla | | | 61,100 | 2,762 | 61,100 | 2,762 |
| Flounders: | | | | | | |
| "California halibut" | 174,800 | 14,568 | 247,300 | 16,038 | 422,100 | 30,606 |
| "Sole" | 100 | 4 | | | 100 | 4 |
| Groupers | | | 46,500 | 2,125 | 46,500 | 2,125 |
| Herring | 3,300 | 54 | | | 3,300 | 54 |
| Horse mackerel | 81,300 | 1,078 | | | 81,300 | 1,078 |
| Kingfish | 700 | 15 | | | 700 | 15 |
| Mackerel | 4,356,000 | 45,320 | 1,000 | 19 | 4,357,000 | 45,339 |
| Mullet | 3,500 | 269 | | | 3,500 | 269 |
| Perch | 700 | 14 | | | 700 | 14 |
| Pilchard or sardines | 5,512,900 | 25,537 | 100 | 1 | 5,513,000 | 25,538 |
| Pompano | 600 | 83 | | | 600 | 83 |
| Rock bass | 123,500 | 5,322 | 23,200 | 1,283 | 146,700 | 6,605 |
| Rockfishes | 74,500 | 3,532 | 160,200 | 7,425 | 234,700 | 10,957 |
| Sculpin | 61,200 | 2,185 | 100 | 5 | 61,300 | 2,190 |
| Sea bass: | | | | | | |
| Black | 3,800 | 167 | 154,900 | 8,715 | 158,700 | 8,882 |
| White | 51,100 | 4,794 | 309,000 | 22,952 | 360,100 | 27,746 |
| Sharks, including grayfish | 51,200 | 1,033 | 10,700 | 190 | 61,900 | 1,223 |
| Sheepshead | 2,800 | 95 | 10,100 | 379 | 12,900 | 474 |
| Skates | 700 | 8 | 100 | 1 | 800 | 9 |
| Smelt | 4,800 | 218 | 900 | 57 | 5,700 | 275 |
| Spanish mackerel | | | 5,300 | 164 | 5,300 | 164 |
| Swordfish | 53,900 | 6,831 | 363,500 | 36,488 | 417,400 | 43,319 |
| Tuna and tunalike fishes: | | | | | | |
| Albacore | 913,100 | 65,342 | 29,900 | 2,952 | 943,000 | 68,294 |
| Bluefin | 1,970,500 | 111,334 | 688,400 | 38,133 | 2,658,900 | 149,467 |
| Bonito | 1,600,200 | 58,238 | 503,500 | 18,529 | 2,103,700 | 76,767 |
| Skipjack or striped tuna | 2,700 | 136 | 14,867,600 | 743,378 | 14,870,300 | 743,514 |
| Yellowfin | 7,200 | 429 | 58,793,800 | 3,532,409 | 58,801,000 | 3,532,838 |
| Whitefish | 900 | 42 | 41,300 | 1,995 | 42,200 | 2,037 |
| Yellowtail | 190,600 | 7,688 | 4,277,200 | 161,137 | 4,467,800 | 168,825 |
| Other fish | 100 | 3 | 300 | 14 | 400 | 17 |
| Total | 15,609,700 | 369,424 | 81,090,200 | 4,627,595 | 96,699,900 | 4,997,019 |
| SHELLFISH | | | | | | |
| Sea crawfish or spiny lobster | 55,200 | 10,357 | 889,600 | 117,718 | 944,800 | 128,075 |
| Squid | 4,700 | 165 | 200 | 11 | 4,900 | 176 |
| Total | 59,900 | 10,522 | 889,800 | 117,729 | 949,700 | 128,251 |
| Grand total | 15,669,600 | 379,946 | 81,980,000 | 4,745,324 | 97,649,600 | 5,125,270 |

## *Fisheries of California, 1938*—Continued

### CATCH: By waters

| Species | Off California | | Off Latin America | |
|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* |
| Anchovies | 735,200 | $9,306 | -------- | -------- |
| Barracuda | 1,260,800 | 69,604 | 1,268,700 | $89,073 |
| Cabrilla | -------- | -------- | 145,100 | 7,337 |
| Carp | 38,900 | 847 | -------- | -------- |
| Catfish | 312,300 | 40,537 | -------- | -------- |
| Flounders: | | | | |
| "California halibut" | 838,600 | 70,574 | 255,800 | 16,947 |
| "Sole" | 7,737,600 | 444,442 | -------- | -------- |
| Other | 1,268,000 | 58,009 | -------- | -------- |
| Flyingfish | 62,900 | 2,337 | -------- | -------- |
| Groupers | -------- | -------- | 68,000 | 3,499 |
| Hake | 36,400 | 368 | -------- | -------- |
| Halibut | 405,800 | 27,952 | -------- | -------- |
| Hardhead | 12,900 | 1,401 | -------- | -------- |
| Herring | 504,900 | 2,759 | -------- | -------- |
| Horse mackerel | 4,133,900 | 45,651 | -------- | -------- |
| Kingfish | 493,200 | 13,014 | -------- | -------- |
| "Lingcod" | 646,000 | 26,808 | -------- | -------- |
| Mackerel | 79,846,700 | 858,841 | 1,300 | 24 |
| Mullet | 3,800 | 295 | -------- | -------- |
| Perch | 155,800 | 7,028 | -------- | -------- |
| Pilchard or sardines | 1,023,389,400 | 5,832,272 | 100 | 1 |
| Pompano | 1,200 | 356 | -------- | -------- |
| Rock bass | 255,600 | 14,394 | 30,500 | 1,718 |
| Rockfishes | 3,474,300 | 149,491 | 168,800 | 7,840 |
| Rudderfishes | 27,600 | 1,482 | -------- | -------- |
| Sablefish | 415,800 | 19,400 | -------- | -------- |
| Salmon | 3,831,700 | 285,583 | -------- | -------- |
| Sculpin | 155,300 | 9,406 | 100 | 5 |
| Sea bass: | | | | |
| Black | 34,800 | 1,862 | 372,700 | 22,075 |
| White | 272,300 | 27,566 | 356,600 | 26,827 |
| Shad | 1,338,700 | 50,646 | -------- | -------- |
| Sharks, including grayfish | 7,501,700 | 137,101 | 12,100 | 242 |
| Sheepshead | 61,100 | 2,379 | 10,900 | 408 |
| Skates | 528,200 | 5,005 | 100 | 1 |
| Smelt | 567,000 | 26,854 | 900 | 57 |
| Spanish mackerel | -------- | -------- | 12,300 | 716 |
| Splittail | 11,100 | 398 | -------- | -------- |
| Squawfish | 1,000 | 37 | -------- | -------- |
| Suckers | 500 | 17 | -------- | -------- |
| Swordfish | 320,600 | 40,292 | 401,900 | 40,510 |
| Tomcod | 3,100 | 49 | -------- | -------- |
| Tuna and tunalike fishes: | | | | |
| Albacore | 7,694,700 | 508,867 | 29,900 | 2,952 |
| Bluefin | 16,512,200 | 916,909 | 1,215,800 | 66,142 |
| Bonito | 4,597,600 | 170,528 | 3,155,400 | 115,087 |
| Skipjack or striped tuna | 2,800 | 139 | 22,650,800 | 1,132,541 |
| Yellowfin | 10,600 | 636 | 78,307,200 | 4,704,456 |
| Whitebait | 106,700 | 6,909 | -------- | -------- |
| Whitefish | 24,100 | 1,356 | 43,900 | 2,137 |
| Yellowtail | 246,200 | 10,505 | 6,566,100 | 242,720 |
| Other fish | 283,100 | 6,081 | 1,800 | 111 |
| Total | 1,170,162,700 | 9,906,293 | 115,076,800 | 6,483,426 |
| SHELLFISH | | | | |
| Crabs | 3,877,500 | 249,835 | -------- | -------- |
| Sea crawfish or spiny lobster | 308,400 | 60,916 | 889,600 | 117,718 |
| Shrimp | 1,847,400 | 36,841 | -------- | -------- |
| Abalone | 424,300 | 91,979 | -------- | -------- |
| Clams: | | | | |
| Hard | 12,400 | 2,705 | -------- | -------- |
| Pismo | 53,600 | 11,391 | -------- | -------- |
| Soft | 27,900 | 5,835 | -------- | -------- |
| Octopus | 32,600 | 2,103 | -------- | -------- |
| Oysters, market: | | | | |
| Eastern | 48,200 | 17,677 | -------- | -------- |
| Pacific | 161,000 | 30,688 | -------- | -------- |
| Western or native | 3,900 | 1,288 | -------- | -------- |
| Squid | 1,599,100 | 35,832 | 200 | 11 |
| Total | 8,396,300 | 547,090 | 889,800 | 117,729 |
| Grand total | 1,178,559,000 | 10,453,383 | 115,966,600 | 6,601,155 |

## *Fisheries of the northern district of California, 1938*

### OPERATING UNITS: BY GEAR

| Item | Gill nets | Lines | | Dip nets | Traps, crab | Rakes and tongs, oyster | Shovels | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| | | Set and hand | Troll | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | 21 | 40 | | 4 | | | 40 |
| On boats and shore | 10 | 78 | 210 | 29 | 56 | 3 | 10 | 265 |
| Total | 10 | 99 | 250 | 29 | 60 | 3 | 10 | 305 |
| Vessels, motor | | 9 | 21 | | 2 | | | 21 |
| Net tonnage | | 73 | 185 | | 19 | | | 185 |
| Boats: | | | | | | | | |
| Motor | 9 | 64 | 201 | | 52 | | 9 | 211 |
| Other | | | | | | 3 | | 3 |
| Apparatus: | | | | | | | | |
| Number | 12 | 316 | 1, 299 | 29 | 963 | 3 | 10 | |
| Square yards | 9, 600 | | | | | | | |
| Hooks | | 24, 159 | 5, 436 | | | | | |

### CATCH: BY GEAR

| Species | Gill nets | | Lines | | | | Paranzella nets and otter trawls | |
|---|---|---|---|---|---|---|---|---|
| | | | Set and hand | | Troll | | | |
| FISH | | | | | | | | |
| Flounders: | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| California halibut | | | | | | | 3, 100 | $248 |
| Sole | | | 1, 700 | $60 | | | 3, 881, 600 | 228, 780 |
| Other | 2, 000 | $81 | | | | | 503, 900 | 22, 456 |
| Hake | | | | | | | 1, 700 | 17 |
| Halibut | | | 208, 800 | 14, 378 | 7, 300 | $503 | 189, 400 | 13, 042 |
| Herring | 5, 100 | 39 | | | | | | |
| Lingcod | | | 157, 300 | 6, 406 | 38, 100 | 1, 552 | 189, 500 | 7, 717 |
| Perch | 8, 500 | 277 | | | | | | |
| Rockfishes | | | 143, 100 | 5, 627 | 11, 200 | 440 | 394, 100 | 15, 254 |
| Sablefish | | | 211, 600 | 10, 832 | | | 5, 800 | 297 |
| Salmon | | | | | 1, 853, 700 | 158, 274 | | |
| Sharks, including grayfish | | | 17, 300 | 831 | 1, 200 | 37 | 121, 900 | 1, 224 |
| Skates | | | | | | | 60, 000 | 601 |
| Smelt | 4, 800 | 172 | | | | | | |
| Tomcod | | | | | | | 2, 200 | 32 |
| Tuna, albacore | | | | | 22, 300 | 1, 539 | | |
| Other fish | | | | | | | 85, 400 | 1, 704 |
| Total | 20, 400 | 569 | 739, 800 | 38, 134 | 1, 933, 800 | 162, 345 | 5, 438, 600 | 291, 372 |
| SHELLFISH | | | | | | | | |
| Crabs | | | | | | | 85, 500 | 4, 850 |
| Octopus | | | 800 | 46 | | | 100 | 6 |
| Total | | | 800 | 46 | | | 85, 600 | 4, 856 |
| Grand total | 20, 400 | 569 | 740, 600 | 38, 180 | 1, 933, 800 | 162, 345 | 5, 524, 200 | 296, 228 |

| Species | Dip nets | | Traps | | Rakes and tongs | | Shovels | |
|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Perch | 400 | $13 | | | | | | |
| Smelt | 8, 400 | 301 | | | | | | |
| Whitebait | 96, 100 | 6, 076 | | | | | | |
| Total | 104, 900 | 6, 390 | | | | | | |
| SHELLFISH | | | | | | | | |
| Crabs | | | 449, 000 | $25, 472 | | | | |
| Clams: | | | | | | | | |
| Hard | | | | | | | 5, 000 | $787 |
| Soft | | | | | | | 200 | 53 |
| Octopus | | | 1, 000 | 58 | | | | |
| Oysters, market, eastern | | | | | 5, 100 | $1, 702 | | |
| Total | | | 450, 000 | 25, 530 | 5, 100 | 1, 702 | 5, 200 | 840 |
| Grand total | 104, 900 | 6, 390 | 450, 000 | 25, 530 | 5, 100 | 1, 702 | 5, 200 | 840 |

NOTE.—The catch by paranzella nets was made by fishermen from the San Francisco district.

### *Fisheries of the San Francisco district of California, 1938*

OPERATING UNITS: BY GEAR

| Item | Purse seines | | Lampara and ring nets | | Haul seines | Gill nets | |
|---|---|---|---|---|---|---|---|
| | Pilchard or sardine[1] | Tuna | Mackerel | Pilchard or sardine | | Drift, salmon | Drift, sea bass |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 946 | 45 | 12 | 110 | | | |
| On boats and shore | | | | 14 | 11 | 272 | 10 |
| Total | 946 | 45 | 12 | 124 | 11 | 272 | 10 |
| Vessels, motor | 87 | 4 | 1 | 10 | | | |
| Net tonnage | 4,769 | 269 | 12 | 102 | | | |
| Boats: | | | | | | | |
| Motor | | | | 2 | 3 | 142 | 6 |
| Other | | | | | 1 | 2 | |
| Accessory boats | 87 | 4 | 1 | 12 | | | |
| Apparatus: | | | | | | | |
| Number | 87 | 4 | 1 | 12 | 3 | 144 | 6 |
| Length, yards | 34,245 | 1,080 | 550 | 3,451 | 400 | | |
| Square yards | | | | | | 465,332 | 12,800 |

| Item | Gill nets—Cont. | | Lines | | Fyke nets | Dip nets | Bag nets, shrimp |
|---|---|---|---|---|---|---|---|
| | Drift, shad | Other | Set and hand | Troll | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | 2 | 14 | 40 | | | 36 |
| On boats and shore | 271 | 54 | 178 | 174 | 68 | 4 | 5 |
| Total | 271 | 56 | 192 | 214 | 68 | 4 | 41 |
| Vessels: | | | | | | | |
| Steam | | | | 1 | | | |
| Net tonnage | | | | 32 | | | |
| Motor | | 1 | 4 | 13 | | | 8 |
| Net tonnage | | 6 | 41 | 182 | | | 48 |
| Total vessels | | 1 | 4 | 14 | | | 8 |
| Total net tonnage | | 6 | 41 | 214 | | | 48 |
| Boats: | | | | | | | |
| Motor | 136 | 31 | 119 | 164 | 43 | 2 | 1 |
| Other | 1 | 1 | 7 | | 9 | | |
| Accessory boats | | | | | | | 4 |
| Apparatus: | | | | | | | |
| Number | 137 | 55 | 1,600 | 992 | 1,660 | 4 | 6 |
| Length, yards | | | | | | | 6,499 |
| Square yards | 389,113 | 86,075 | | | | | |
| Hooks | | | 140,596 | 2,855 | | | |

| Item | Paranzella nets | Beam trawls | Otter trawls | Traps, crab | Rakes and tongs, oyster | Shovels | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 95 | | 15 | | | | 1,197 |
| On boats and shore | | 13 | | 264 | 54 | 78 | 838 |
| Total | 95 | 13 | 15 | 264 | 54 | 78 | 2,035 |
| Vessels: | | | | | | | |
| Steam | 1 | | | | | | 1 |
| Net tonnage | 32 | | | | | | 32 |
| Motor | 17 | | 3 | | | | 124 |
| Net tonnage | 235 | | 60 | | | | 5,201 |
| Total vessels | 18 | | 3 | | | | 125 |
| Total net tonnage | 267 | | 60 | | | | 5,233 |
| Boats: | | | | | | | |
| Motor | | 13 | | 252 | 19 | 3 | 524 |
| Other | | | | | 26 | | 41 |
| Accessory boats | | | | | | | 101 |
| Apparatus: | | | | | | | |
| Number | 9 | 13 | 3 | 4,950 | 54 | 78 | |
| Yards at mouth | 150 | 87 | 35 | | | | |

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[1] Includes 17 motor vessels, having a total capacity of 1,105 net tons, and a crew of 188 men, which also operated pilchard or sardine purse seines in Washington and Oregon waters, and contributed to the catch in those States. Seven of the vessels operated in Oregon, 6 in Washington, and 4 in both States.

*Fisheries of the San Francisco district of California, 1938*—Continued

CATCH: BY GEAR

| Species | Purse seines | | Lampara and ring nets | | Haul seines | | Gill nets | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| FISH | | | | | | | | |
| Anchovies | 30,000 | $450 | 219,800 | $3,297 | 2,000 | $29 | | |
| Carp | | | | | 5,400 | 80 | 7,600 | $164 |
| Flounders, "California halibut" | | | | | | | 100 | 12 |
| Hardhead | | | | | 2,500 | 200 | | |
| Herring | | | 1,700 | 17 | 302,200 | 1,511 | 191,700 | 1,117 |
| Kingfish | | | 5,400 | 216 | | | | |
| Mackerel | | | 1,000 | 30 | | | | |
| Perch | | | | | 37,600 | 1,433 | 31,700 | 810 |
| Pilchard or sardines | 433,395,700 | 2,423,199 | 13,227,100 | 77,760 | | | 8,800 | 177 |
| Salmon | | | | | | | 1,668,400 | 97,357 |
| Sea bass, white | 100 | 6 | 200 | 14 | 800 | 72 | 10,000 | 905 |
| Shad | | | | | | | 1,338,700 | 50,646 |
| Sharks, including grayfish | 1,900 | 30 | 4,900 | 90 | | | 400 | 4 |
| Smelt | | | 8,300 | 431 | 11,800 | 605 | 208,600 | 10,764 |
| Splittail | | | | | 2,200 | 22 | | |
| Squawfish | | | | | | | 300 | 11 |
| Whitebait | | | 100 | 6 | | | | |
| Total | 433,427,700 | 2,423,685 | 13,468,500 | 81,861 | 364,500 | 3,952 | 3,466,300 | 161,967 |

| Species | Lines | | | | Fyke nets | | Paranzella nets and otter trawls | |
|---|---|---|---|---|---|---|---|---|
| | Set and hand | | Troll | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| FISH | | | | | | | | |
| Carp | | | | | 24,000 | $518 | | |
| Catfish | 17,100 | $2,220 | | | 295,100 | 38,310 | | |
| Flounders: | | | | | | | | |
| "California halibut" | 1,500 | 187 | | | | | 13,000 | $1,637 |
| "Sole" | 1,900 | 96 | | | | | 3,190,800 | 190,294 |
| Other | 1,200 | 48 | | | | | 682,700 | 30,629 |
| Hake | | | | | | | 18,000 | 180 |
| Halibut | 300 | 29 | | | | | | |
| Hardhead | | | | | 10,400 | 1,201 | | |
| Kingfish | | | | | | | 800 | 33 |
| "Lingcod" | 128,600 | 4,788 | 1,000 | $35 | | | 44,300 | 1,649 |
| Rockfishes | 308,800 | 16,866 | 400 | 24 | | | 251,200 | 13,058 |
| Sablefish | 7,400 | 173 | | | | | 1,100 | 26 |
| Salmon | | | 109,900 | 9,073 | | | | |
| Sharks, including grayfish | 3,312,900 | 59,405 | | | | | 998,700 | 9,988 |
| Skates | | | | | | | 329,400 | 3,294 |
| Spittail | | | | | 8,900 | 376 | | |
| Squawfish | | | | | 700 | 26 | | |
| Suckers | | | | | 500 | 17 | | |
| Tomcod | | | | | | | 900 | 17 |
| Tuna, albacore | | | 7,000 | 407 | | | | |
| Other fish | 700 | 14 | | | | | 74,900 | 1,498 |
| Total | 3,780,400 | 83,826 | 118,300 | 9,539 | 339,600 | 40,448 | 5,605,800 | 252,303 |
| SHELLFISH | | | | | | | | |
| Crabs | | | | | | | 90,200 | 5,992 |
| Octopus | 6,200 | 337 | | | | | | |
| Total | 6,200 | 337 | | | | | 90,200 | 5,992 |
| Grand total | 3,786,600 | 84,163 | 118,300 | 9,539 | 339,600 | 40,448 | 5,696,000 | 258,295 |

| Species | Beam trawls | | Dip nets | | Bag nets | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| FISH | | | | | | |
| Flounders, other than "sole" | 2,300 | $74 | | | | |
| Smelt | | | 7,300 | $389 | | |
| Whitebait | | | 8,000 | 586 | | |
| Total | 2,300 | 74 | 15,300 | 975 | | |
| SHELLFISH | | | | | | |
| Shrimp | 392,500 | 7,850 | | | 1,451,600 | $28,320 |
| Grand total | 394,800 | 7,924 | 15,300 | 975 | 1,451,600 | 28,320 |

## *Fisheries of the San Francisco district of California, 1938*—Continued

### CATCH: BY GEAR—Continued

| Species | Traps | | Rakes and tongs | | Shovels | |
|---|---|---|---|---|---|---|
| SHELLFISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs | 3,080,900 | $204,786 | | | | |
| Clams: | | | | | | |
| Hard | | | | | | 1,600 | $381 |
| Soft | | | | | 27,700 | 5,782 |
| Oysters, market: | | | | | | |
| Eastern | | | 43,100 | $15,975 | | |
| Pacific | | | 156,800 | 29,400 | | |
| Western or native | | | 3,900 | 1,288 | | |
| Total | 3,080,900 | 204,786 | 203,800 | 46,663 | 29,300 | 6,163 |

## *Fisheries of the Monterey district of California, 1938*

### OPERATING UNITS: BY GEAR

| Item | Purse seines | | | Lampara and ring nets | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mackerel | Pilchard or sardine [1] | Tuna | Pilchard or sardine | Other | Set, "California halibut" | Set, crab | Drift, sea bass | Other |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 23 | 500 | 113 | 70 | 36 | | 2 | 2 | 2 |
| On boats and shore | | | | 82 | 70 | 30 | 48 | 31 | 33 |
| Total | 23 | 500 | 113 | 152 | 106 | 30 | 50 | 33 | 35 |
| Vessels, motor | 2 | 44 | 10 | 6 | 5 | | 1 | 1 | 1 |
| Net tonnage | 138 | 2,543 | 609 | 42 | 32 | | 7 | 8 | 7 |
| Boats: | | | | | | | | | |
| Motor | | | | 7 | 10 | 16 | 31 | 18 | 16 |
| Other | | | | | | 2 | 1 | | 6 |
| Accessory boats | 2 | 44 | 10 | 13 | | | | | |
| Apparatus: | | | | | | | | | |
| Number | 2 | 44 | 10 | 13 | 15 | 18 | 33 | 19 | 32 |
| Length, yards | 850 | 16,458 | 6,075 | 3,628 | 3,895 | | | | |
| Square yards | | | | | | 55,392 | 55,994 | 35,720 | 37,110 |

| Item | Lines | | Otter trawls | Traps | | Rakes and tongs, oyster | Shovels | Abalone outfits | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|
| | Set and hand | Troll | | Crab | Octopus | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 6 | 27 | 24 | | | | | 50 | 627 |
| On boats and shore | 207 | 246 | 15 | 7 | 7 | 4 | 30 | 16 | 423 |
| Total | 213 | 273 | 39 | 7 | 7 | 4 | 30 | 66 | 1,050 |
| Vessels, motor | 3 | 14 | 5 | | | | | 10 | 66 |
| Net tonnage | 29 | 133 | 38 | | | | | 115 | 2,740 |
| Boats: | | | | | | | | | |
| Motor | 152 | 190 | 4 | 5 | 5 | 1 | 5 | 3 | 214 |
| Other | 6 | | | | | | 1 | | 9 |
| Accessory boats | | | | | | | | 13 | 68 |
| Apparatus: | | | | | | | | | |
| Number | 764 | 1,362 | 9 | 68 | 94 | 4 | 30 | 13 | |
| Yards at mouth | | | 105 | | | | | | |
| Hooks | 58,564 | 3,682 | | | | | | | |

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[1] Includes 5 motor vessels having a total capacity of 347 net tons, and a crew of 61 men which also operated pilchard or sardine purse seines in Washington and Oregon waters and contributed to the catch in those States. Four of the vessels operated in Oregon and 1 in Washington.

*Fisheries of the Monterey district of California, 1938*—Continued

CATCH: BY GEAR

| Species | Purse seines | | Lampara and ring nets | | Gill nets | |
|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Anchovies | | | 34,100 | $719 | | |
| Carp | | | | | 1,400 | $55 |
| Catfish | | | | | 100 | 7 |
| Flounders: | | | | | | |
| "California halibut" | 200 | $15 | 700 | 60 | 22,100 | 1,839 |
| "Sole" | | | | | 10,000 | 475 |
| Other | | | | | 4,600 | 162 |
| Herring | | | 400 | 9 | 400 | 10 |
| Horse mackerel | | | 95,800 | 7,466 | 800 | 66 |
| Kingfish | | | 38,200 | 1,437 | 67,200 | 2,528 |
| "Lingcod" | | | | | 3,100 | 168 |
| Mackerel | 149,700 | 3,742 | 802,400 | 20,060 | 2,000 | 55 |
| Perch | | | 2,700 | 139 | 11,100 | 508 |
| Pilchard or sardines | 296,484,000 | 1,630,662 | 14,899,500 | 124,593 | 2,200 | 44 |
| Rockfishes | | | | | 6,500 | 318 |
| Sablefish | | | | | 200 | 4 |
| Seabass, white | 2,900 | 300 | 100 | 13 | 19,800 | 2,028 |
| Sharks, including grayfish | 65,900 | 1,213 | 47.300 | 1,020 | 830,200 | 15,838 |
| Skates | | | | | 11,400 | 57 |
| Smelt | 300 | 12 | 30,600 | 1,375 | 58,300 | 2,629 |
| Whitebait | | | 2,200 | 213 | 300 | 28 |
| Total | 296,703,000 | 1.635,944 | 15,954,000 | 157,104 | 1,051,700 | 26,819 |
| SHELLFISH | | | | | | |
| Crabs | | | | | 166,100 | 8,517 |
| Octopus | | | | | 100 | 5 |
| Squid | | | 1,471,800 | 31,511 | 200 | 10 |
| Total | | | 1,471,800 | 31,511 | 166.400 | 8,532 |
| Grand total | 296,703,000 | 1,635.944 | 17,425,800 | 188,615 | 1,218,100 | 35.351 |

| Species | Lines | | | | Paranzella nets, and otter trawls | |
|---|---|---|---|---|---|---|
| | Set and hand | | Troll | | | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders: | | | | | | |
| "California halibut" | 3,900 | $327 | 100 | $5 | 12,600 | $1,053 |
| "Sole" | 9,500 | 455 | | | 433,300 | 17,929 |
| Other | 10,700 | 599 | | | 54,100 | 2.664 |
| Hake | | | | | 16,400 | 164 |
| Horse mackerel | 2,000 | 150 | | | | |
| Kingfish | 34,900 | 1,312 | | | 6.500 | 239 |
| "Lingcod" | 76,100 | 4,066 | 500 | 27 | 5,600 | 297 |
| Mackerel | 528,100 | 14,452 | | | | |
| Perch | | | | | 1,900 | 96 |
| Rockfishes | 1,829,000 | 74,033 | 400 | 20 | 16,700 | 833 |
| Sablefish | 37,100 | 907 | | | 1,100 | 28 |
| Salmon | | | 199,500 | 20,861 | | |
| Sea bass, white | 1,000 | 103 | | | 100 | 6 |
| Sharks, including grayfish | 728,500 | 13,781 | 29,600 | 355 | 68,300 | 1,123 |
| Skates | 3,300 | 27 | | | 77,900 | 406 |
| Smelt | 3,600 | 164 | | | | |
| Tuna, albacore | | | 2,591,400 | 142,068 | | |
| Other fish | 4,200 | 160 | | | 4,800 | 184 |
| Total | 3,271,900 | 110,536 | 2,821,500 | 163.336 | 699,300 | 25,022 |
| SHELLFISH | | | | | | |
| Crabs | | | | | 1,200 | 60 |
| Octopus | 4,800 | 329 | | | 200 | 12 |
| Total | 4,800 | 329 | | | 1,400 | 72 |
| Grand total | 3,276,700 | 110,865 | 2,821,500 | 163,336 | 700,700 | 25,094 |

## *Fisheries of the Monterey district of California, 1938*—Continued

CATCH: BY GEAR—Continued

| Species | Traps | | Rakes and tongs | | Shovels | | Abalone outfits | |
|---|---|---|---|---|---|---|---|---|
| SHELLFISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs | 700 | $35 | | | | | | |
| Shrimp | 3,300 | 671 | | | | | | |
| Abalone | | | | | | | 240,800 | $56,586 |
| Clams: | | | | | | | | |
| Hard | | | | | 200 | $40 | | |
| Pismo | | | | | 5,000 | 1,221 | | |
| Octopus | 19,300 | 1,301 | | | | | | |
| Oysters, market, Pacific | | | 1,100 | $160 | | | | |
| Total | 23,300 | 2,007 | 1,100 | 160 | 5,200 | 1,261 | 240,800 | 56,586 |

NOTE.—The catch by paranzella nets was made by fishermen from the San Francisco district.

## *Fisheries of the San Pedro district of California, 1938*

OPERATING UNITS: BY GEAR

| Item | Purse seines | | | Lampara and ring nets | | | |
|---|---|---|---|---|---|---|---|
| | Mackerel | Pilchard or sardine [1] | Tuna | Mackerel | Pilchard or sardine | Tuna | Other |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 166 | 1,029 | 867 | 632 | 771 | 219 | 7 |
| On boats and shore | | | | | | | 82 |
| Total | 166 | 1,029 | 867 | 632 | 771 | 219 | 89 |
| Vessels, motor | 16 | 94 | 79 | 51 | 64 | 17 | 3 |
| Net tonnage | 474 | 4,785 | 4,203 | 1,723 | 2,019 | 492 | 17 |
| Boats, motor | | | | | | | 22 |
| Accessory boats | 16 | 94 | 79 | 51 | 64 | 17 | 3 |
| Apparatus: | | | | | | | |
| Number | 16 | 94 | 79 | 51 | 64 | 17 | 25 |
| Length, yards | 7,129 | 37,618 | 47,480 | 29,138 | 33,323 | 9,775 | 6,671 |

| Item | Gill nets | | | Trammel nets | Lines | | Paranzella nets |
|---|---|---|---|---|---|---|---|
| | Drift, barracuda | Set, sea bass | Other | | Set and hand | Troll | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | 4 | 3 | 11 | 469 | 36 | 8 |
| On boats and shore | 42 | 50 | 31 | 53 | 779 | 571 | 12 |
| Total | 42 | 54 | 34 | 64 | 1,248 | 607 | 20 |
| Vessels, motor | | 2 | 2 | 4 | 97 | 17 | 2 |
| Net tonnage | | 14 | 14 | 43 | 2,714 | 116 | 26 |
| Boats: | | | | | | | |
| Motor | 17 | 19 | 19 | 20 | 455 | 418 | 4 |
| Other | | 1 | 1 | | 16 | | |
| Accessory | | | | | 137 | | |
| Apparatus: | | | | | | | |
| Number | 17 | 22 | 26 | 24 | 2,837 | 2,792 | 3 |
| Square yards | 106,012 | 73,040 | 28,798 | 121,733 | | | |
| Yards at mouth | | | | | | | 50 |
| Hooks | | | | | 496,379 | 2,842 | |

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[1] Includes 10 motor vessels, having a total capacity of 621 net tons, and a crew of 111 men, which also operated pilchard or sardine purse seines in Washington and Oregon waters, and contributed to the catch in those States. All of the vessels operated in Washington, and 4 also operated in Oregon.

*Fisheries of the San Pedro district of California, 1938*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Traps, sea crawfish | Harpoons, swordfish | Rakes and tongs | Shovels | Abalone outfits | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 6 | 19 | | | | 2,290 |
| On boats and shore | 155 | 95 | 4 | 66 | 11 | 993 |
| Total | 161 | 114 | 4 | 66 | 11 | 3,283 |
| Vessels, motor | 3 | 7 | | | | 263 |
| Net tonnage | 32 | 54 | | | | 9,724 |
| Boats: | | | | | | |
| Motor | 91 | 40 | 1 | 6 | 4 | 588 |
| Other | 17 | | 2 | | 1 | 27 |
| Accessory boats | | | | | | 294 |
| Apparatus, number | 4,498 | 47 | 4 | 66 | 5 | |

CATCH OFF CALIFORNIA: BY GEAR

| Species | Purse seines | | Lampara and ring nets | | Gill nets | | Trammel nets | |
|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Anchovies | | | 449,300 | $4,811 | | | | |
| Barracuda | 77,100 | $5,027 | 107,300 | 6,436 | 240,200 | $14,628 | | |
| Carp | | | | | 500 | 30 | | |
| Flounders: | | | | | | | | |
| "California halibut" | | | 500 | 48 | 400 | 33 | 285,400 | $38,038 |
| "Sole" | | | | | | | 2,300 | 116 |
| Other | | | | | | | 300 | 10 |
| Flyingfish | | | 100 | 5 | 62,800 | 2,332 | | |
| Herring | | | | | 100 | 2 | | |
| Horse mackerel | 2,782,600 | 25,941 | 1,169,700 | 10,911 | 1,200 | 29 | | |
| Kingfish | | | 290,700 | 6,194 | 8,400 | 178 | 100 | 2 |
| "Lingcod" | | | | | | | 200 | 8 |
| Mackerel | 13,682,300 | 143,309 | 38,796,000 | 406,278 | 29,600 | 580 | 100 | 2 |
| Mullet | | | | | 300 | 26 | | |
| Perch | | | 47,400 | 3,018 | 12,900 | 659 | | |
| Pilchard or sardines | 152,349,000 | 909,480 | 107,504,100 | 640,746 | 6,100 | 74 | | |
| Pompano | | | 600 | 273 | | | | |
| Rock bass | | | 3,400 | 251 | 7,300 | 389 | 2,400 | 138 |
| Rockfishes | | | 600 | 26 | 1,100 | 42 | | |
| Rudderfishes | | | 27,600 | 1,482 | | | | |
| Sculpin | | | | | 300 | 19 | 800 | 63 |
| Sea bass: | | | | | | | | |
| Black | 200 | 8 | 1,300 | 71 | 2,200 | 119 | 1,600 | 85 |
| White | 7,900 | 822 | 32,000 | 3,327 | 131,100 | 13,590 | 1,500 | 159 |
| Sharks, including grayfish | 2,700 | 87 | 1,000 | 39 | 194,600 | 4,744 | 139,300 | 3,781 |
| Sheepshead | | | | | | | 3,400 | 132 |
| Skates | | | | | | | 5,700 | 140 |
| Smelt | | | 159,500 | 7,249 | 54,700 | 2,281 | | |
| Swordfish | 700 | 94 | | | | | | |
| Tuna and tunalike fishes: | | | | | | | | |
| Albacore | 9,000 | 655 | 5,400 | 394 | 300 | 21 | | |
| Bluefin | 9,681,100 | 536,330 | 4,847,900 | 268,538 | 300 | 19 | | |
| Bonito | 1,025,200 | 38,425 | 1,321,100 | 49,506 | 17,800 | 640 | 4,200 | 155 |
| Skipjack or striped tuna | | | 100 | 3 | | | | |
| Yellowfin | 100 | 8 | 1,200 | 74 | | | 200 | 11 |
| Whitefish | | | | | | | 200 | 10 |
| Yellowtail | 2,600 | 129 | 31,300 | 1,587 | 3,100 | 159 | | |
| Other fish | | | 91,500 | 1,038 | 1,200 | 85 | 4,800 | 336 |
| Total | 179,620,500 | 1,660,315 | 154,889,600 | 1,412,305 | 776,500 | 40,679 | 452,500 | 43,186 |
| SHELLFISH | | | | | | | | |
| Sea crawfish or spiny lobster | | | | | | | 8,300 | 458 |
| Squid | 51,500 | 1,744 | 70,600 | 2,390 | | | 300 | 12 |
| Total | 51,500 | 1,744 | 70,600 | 2,390 | | | 8,600 | 470 |
| Grand total | 179,672,000 | 1,662,059 | 154,960,200 | 1,414,695 | 776,500 | 40,679 | 461,100 | 43,656 |

*Fisheries of the San Pedro district of California, 1938*—Continued

CATCH OFF CALIFORNIA: BY GEAR—Continued

| Species | Lines |  |  |  | Paranzella nets |  | Traps |  |
|---|---|---|---|---|---|---|---|---|
|  | Set and hand |  | Troll |  |  |  |  |  |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Barracuda | 137,000 | $8,239 | 336,200 | $20,189 |  |  |  |  |
| Flounders: |  |  |  |  |  |  |  |  |
| "California halibut" | 53,000 | 5,096 | 600 | 58 | 266,600 | $7,350 |  |  |
| "Sole" | 1,900 | 101 |  |  | 204,500 | 6,132 |  |  |
| Other | 6,200 | 1,286 |  |  |  |  |  |  |
| Hake | 300 | 7 |  |  |  |  |  |  |
| Horse mackerel | 500 | 10 |  |  |  |  |  |  |
| Kingfish | 40,200 | 858 |  |  | 100 | 2 |  |  |
| "Lingcod" | 1,700 | 95 |  |  |  |  |  |  |
| Mackerel | 21,499,200 | 225,007 | 300 | 6 |  |  |  |  |
| Perch | 700 | 47 |  |  |  |  | 200 | $14 |
| Rock bass | 81,500 | 5,714 | 400 | 26 |  |  | 37,100 | 2,554 |
| Rockfishes | 434,300 | 19,320 |  |  | 2,200 | 87 | 200 | 11 |
| Sablefish | 151,500 | 7,133 |  |  |  |  |  |  |
| Salmon |  |  | 200 | 18 |  |  |  |  |
| Sculpin | 89,000 | 6,844 |  |  | 200 | 7 | 3,800 | 288 |
| Sea bass: |  |  |  |  |  |  |  |  |
| Black | 25,000 | 1,376 |  |  | 700 | 36 |  |  |
| White | 11,300 | 1,173 | 2,400 | 254 |  |  |  |  |
| Sharks, including grayfish | 787,500 | 20,400 | 1,900 | 61 | 94,500 | 2,017 |  |  |
| Sheepshead | 28,000 | 1,095 |  |  |  |  | 26,900 | 1,057 |
| Skates | 4,800 | 115 |  |  | 35,000 | 357 |  |  |
| Smelt | 5,800 | 255 |  |  | 200 | 9 |  |  |
| Tuna and tunalike fishes: |  |  |  |  |  |  |  |  |
| Albacore | 3,000,500 | 218,107 | 1,145,700 | 80,334 |  |  |  |  |
| Bluefin | 10,000 | 555 | 2,400 | 133 |  |  |  |  |
| Bonito | 108,900 | 4,079 | 520,200 | 19,485 |  |  |  |  |
| Yellowfin | 1,900 | 114 |  |  |  |  |  |  |
| Whitefish | 19,800 | 1,132 |  |  |  |  | 3,200 | 172 |
| Yellowtail | 12,200 | 620 | 6,400 | 322 |  |  |  |  |
| Other fish | 15,000 | 1,021 | 200 | 17 | 300 | 21 |  |  |
| Total | 26,527,700 | 529,799 | 2,016,900 | 120,903 | 604,300 | 16,018 | 71,400 | 4,096 |
| SHELLFISH |  |  |  |  |  |  |  |  |
| Crabs |  |  |  |  |  |  | 3,900 | 123 |
| Sea crawfish or spiny lobster |  |  |  |  |  |  | 244,900 | 50,101 |
| Octopus | 100 | 9 |  |  |  |  |  |  |
| Total | 100 | 9 |  |  |  |  | 248,800 | 50,224 |
| Grand total | 26,527,800 | 529,808 | 2,016,900 | 120,903 | 604,300 | 16,018 | 320,200 | 54,320 |

| Species | Harpoons |  | Rakes and tongs |  | Shovels |  | Abalone outfits |  |
|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Swordfish | 266,000 | $33,367 |  |  |  |  |  |  |
| SHELLFISH |  |  |  |  |  |  |  |  |
| Abalone |  |  |  |  |  |  | 183,500 | $35,393 |
| Clams: |  |  |  |  |  |  |  |  |
| Hard |  |  |  |  | 5,600 | $1,497 |  |  |
| Pismo |  |  |  |  | 48,600 | 10,170 |  |  |
| Oysters, market, Pacific |  |  | 3,100 | $1,128 |  |  |  |  |
| Total |  |  | 3,100 | 1,128 | 54,200 | 11,667 | 183,500 | 35,393 |
| Grand total | 266,000 | 33,367 | 3,100 | 1,128 | 54,200 | 11,667 | 183,500 | 35,393 |

*Fisheries of the San Pedro district of California, 1938*—Continued

CATCH OFF LATIN AMERICA: BY GEAR

| Species | Purse seines | | Gill nets | | Trammel nets | | Lines, set and hand | | Harpoons | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Barracuda | 691, 800 | $52, 369 | -------- | ------- | -------- | ------- | 82, 700 | $6, 260 | -------- | ------- |
| Cabrilla | -------- | ------- | -------- | ------- | -------- | ------- | 84, 000 | 4, 575 | -------- | ------- |
| Flounders, "California halibut" | 100 | 9 | -------- | ------- | 7, 800 | $835 | 600 | 65 | -------- | ------- |
| Groupers | -------- | ------- | -------- | ------- | -------- | ------- | 21, 500 | 1, 374 | -------- | ------- |
| Mackerel | -------- | ------- | -------- | ------- | -------- | ------- | 300 | 5 | -------- | ------- |
| Rock bass | -------- | ------- | -------- | ------- | -------- | ------- | 7, 300 | 435 | -------- | ------- |
| Rockfishes | -------- | ------- | -------- | ------- | -------- | ----- | 8, 600 | 415 | -------- | ------- |
| Sea bass: | | | | | | | | | | |
| Black | 800 | 52 | 900 | $54 | -------- | ------- | 216, 100 | 13, 254 | -------- | ------- |
| White | 3, 100 | 254 | 20, 800 | 1, 695 | -------- | ------- | 23, 700 | 1, 926 | -------- | ------- |
| Sharks, including grayfish | -------- | ------- | -------- | ------- | -------- | ------- | 1, 400 | 52 | -------- | ------- |
| Sheepshead | -------- | ------- | -------- | ------- | -------- | ------- | 800 | 29 | -------- | ------- |
| Spanish mackerel | -------- | ------- | -------- | ------- | -------- | ------- | 7, 000 | 552 | -------- | ------- |
| Swordfish | -------- | ------- | -------- | ------- | -------- | ------- | -------- | ------- | 38, 400 | $4, 022 |
| Tuna and tunalike fishes: | | | | | | | | | | |
| Bluefin | 526, 500 | 27, 961 | -------- | ------- | -------- | ------- | 900 | 48 | -------- | ------- |
| Bonito | 2, 581, 500 | 93, 967 | -------- | ------- | -------- | ------- | 70, 400 | 2, 591 | -------- | ------- |
| Skipjack or striped tuna | 1, 394, 800 | 69, 740 | -------- | ------- | -------- | ------- | 6, 388, 400 | 319, 423 | -------- | ------- |
| Yellowfin | 3, 917, 200 | 235, 032 | -------- | ------- | -------- | ------- | 15, 596, 200 | 937, 015 | -------- | ------- |
| Whitefish | -------- | ------- | -------- | ------- | -------- | ------- | 2, 600 | 142 | -------- | ------- |
| Yellowtail | 1, 585, 000 | 56, 493 | 600 | 24 | -------- | ------- | 703, 300 | 25, 066 | -------- | ------- |
| Other fish | -------- | ------- | -------- | ------- | -------- | ------- | 1, 500 | 97 | -------- | ------- |
| Total | 10,700800 | 535, 877 | 22, 300 | 1, 773 | 7, 800 | 835 | 23, 217, 300 | 1,313,324 | 38, 400 | 4, 022 |

*Fisheries of the San Diego district of California, 1938*

OPERATING UNITS: BY GEAR

| Item | Lampara and ring nets | | | | Gill nets | | |
|---|---|---|---|---|---|---|---|
| | Mackerel | Pilchard or sardine | Tuna | Other | Drift, barracuda | Set, sea bass | Other |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 148 | 190 | 11 | -------- | -------- | 4 | -------- |
| On boats and shore | 13 | 13 | 11 | 5 | 22 | 26 | 11 |
| Total | 161 | 203 | 22 | 5 | 22 | 30 | 11 |
| Vessels, motor | 13 | 17 | 1 | -------- | -------- | 1 | -------- |
| Net tonnage | 129 | 183 | 12 | -------- | -------- | 19 | -------- |
| Boats, motor | 1 | 1 | 1 | 1 | 7 | 9 | 6 |
| Accessory boats | 13 | 17 | 1 | 1 | -------- | -------- | -------- |
| Apparatus: | | | | | | | |
| Number | 14 | 18 | 2 | 1 | 7 | 10 | 6 |
| Length, yards | 4, 970 | 4, 680 | 640 | 200 | -------- | -------- | -------- |
| Square yards | -------- | -------- | -------- | -------- | 29, 626 | 41, 703 | 8, 318 |

| Item | Trammel nets | Lines | | Traps, sea crawfish | Harpoons, swordfish | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| | | Set and hand | Troll | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 5 | 1, 090 | 9 | 2 | 33 | 1, 209 |
| On boats and shore | 28 | 158 | 139 | 26 | 43 | 262 |
| Total | 33 | 1, 248 | 148 | 28 | 76 | 1, 471 |
| Vessels, motor | 1 | 115 | 3 | 1 | 9 | 121 |
| Net tonnage | 11 | 7, 650 | 24 | 9 | 76 | 7, 712 |
| Boats: | | | | | | |
| Motor | 9 | 66 | 90 | 21 | 16 | 120 |
| Other | -------- | -------- | -------- | 1 | -------- | 1 |
| Accessory boats | -------- | 135 | -------- | -------- | -------- | 138 |
| Apparatus: | | | | | | |
| Number | 10 | 1, 387 | 608 | 963 | 25 | -------- |
| Square yards | 96, 613 | -------- | -------- | -------- | -------- | -------- |
| Hooks | -------- | 31, 257 | 608 | -------- | -------- | -------- |

### *Fisheries of the San Diego district of California, 1938*—Continued

CATCH OFF CALIFORNIA: BY GEAR

| Species | Purse seines | | Lampara and ring nets | | Gill nets | | Trammel nets | |
|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Barracuda | -------- | -------- | 61,200 | $2,546 | 150,900 | $6,270 | 200 | $7 |
| Flounders, "California halibut" | -------- | -------- | 600 | 51 | -------- | -------- | 172,400 | 14,367 |
| Herring | -------- | -------- | -------- | -------- | 3,300 | 54 | -------- | -------- |
| Horse mackerel | -------- | -------- | 80,800 | 1,068 | 500 | 10 | -------- | -------- |
| Kingfish | -------- | -------- | -------- | -------- | 400 | 8 | -------- | -------- |
| Mackerel | -------- | -------- | 3,901,900 | 40,405 | 22,500 | 450 | -------- | -------- |
| Mullet | -------- | -------- | -------- | -------- | 3,500 | 269 | -------- | -------- |
| Perch | -------- | -------- | 700 | 14 | -------- | -------- | -------- | -------- |
| Pilchard or sardines | -------- | -------- | 5,512,900 | 25,537 | -------- | -------- | -------- | -------- |
| Pompano | -------- | -------- | 600 | 83 | -------- | -------- | -------- | -------- |
| Rock bass | -------- | -------- | 2,100 | 91 | 100 | 6 | -------- | -------- |
| Rockfishes | -------- | -------- | -------- | -------- | -------- | -------- | 300 | 14 |
| Sea bass: | | | | | | | | |
| Black | -------- | -------- | -------- | -------- | 100 | 7 | 800 | 35 |
| White | -------- | -------- | 16,500 | 1,555 | 19,400 | 1,820 | 1,500 | 138 |
| Sharks, including grayfish | -------- | -------- | 600 | 13 | 3,000 | 61 | 26,500 | 535 |
| Sheepshead | -------- | -------- | -------- | -------- | -------- | -------- | 500 | 17 |
| Skates | -------- | -------- | -------- | -------- | -------- | -------- | 500 | 5 |
| Smelt | -------- | -------- | 1,000 | 45 | 3,800 | 173 | -------- | -------- |
| Tuna and tunalike fishes: | | | | | | | | |
| Bluefin | 156,100 | $8,818 | 1,451,500 | 82,011 | 100 | 7 | -------- | -------- |
| Bonito | 37,500 | 1,366 | 823,500 | 29,967 | 4,200 | 153 | 3,800 | 139 |
| Yellowfin | -------- | -------- | 500 | 28 | -------- | -------- | -------- | -------- |
| Whitefish | -------- | -------- | -------- | -------- | -------- | -------- | 500 | 22 |
| Yellowtail | -------- | -------- | 102,000 | 4,112 | 100 | 4 | 400 | 15 |
| Total | 193,600 | 10,184 | 11,956,400 | 187,526 | 211,900 | 9,292 | 207,400 | 15,294 |
| SHELLFISH | | | | | | | | |
| Sea crawfish or spiny lobster | -------- | -------- | -------- | -------- | -------- | -------- | 800 | 145 |
| Squid | -------- | -------- | 4,700 | 165 | -------- | -------- | -------- | -------- |
| Total | -------- | -------- | 4,700 | 165 | -------- | -------- | 800 | 145 |
| Grand total | 193,600 | 10,184 | 11,961,100 | 187,691 | 211,900 | 9,292 | 208,200 | 15,439 |

| Species | Lines | | | | Traps | | Harpoons | |
|---|---|---|---|---|---|---|---|---|
| | Set and hand | | Troll | | | | | |
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Barracuda | 135,000 | $5,611 | 15,700 | $651 | -------- | -------- | -------- | -------- |
| Flounders: | | | | | | | | |
| "California halibut" | 1,800 | 150 | -------- | -------- | -------- | -------- | -------- | -------- |
| "Sole" | 100 | 4 | -------- | -------- | -------- | -------- | -------- | -------- |
| Kingfish | 300 | 7 | -------- | -------- | -------- | -------- | -------- | -------- |
| Mackerel | 431,600 | 4,465 | -------- | -------- | -------- | -------- | -------- | -------- |
| Rock bass | 97,800 | 4,212 | -------- | -------- | 23,500 | $1,013 | -------- | -------- |
| Rockfishes | 74,200 | 3,518 | -------- | -------- | -------- | -------- | -------- | -------- |
| Sculpin | 61,200 | 2,185 | -------- | -------- | -------- | -------- | -------- | -------- |
| Sea bass: | | | | | | | | |
| Black | 2,900 | 125 | -------- | -------- | -------- | -------- | -------- | -------- |
| White | 13,400 | 1,256 | 300 | 25 | -------- | -------- | -------- | -------- |
| Sharks, including grayfish | 21,100 | 424 | -------- | -------- | -------- | -------- | -------- | -------- |
| Sheepshead | 1,500 | 52 | -------- | -------- | 800 | 26 | -------- | -------- |
| Skates | 200 | 3 | -------- | -------- | -------- | -------- | -------- | -------- |
| Swordfish | -------- | -------- | -------- | -------- | -------- | -------- | 53,900 | $6,831 |
| Tuna and tunalike fishes: | | | | | | | | |
| Albacore | 781,700 | 52,205 | 131,400 | 13,137 | -------- | -------- | -------- | -------- |
| Bluefin | 362,800 | 20,498 | -------- | -------- | -------- | -------- | -------- | -------- |
| Bonito | 239,700 | 8,727 | 491,500 | 17,886 | -------- | -------- | -------- | -------- |
| Skipjack or striped tuna | 2,700 | 136 | -------- | -------- | -------- | -------- | -------- | -------- |
| Yellowfin | 5,500 | 327 | 1,200 | 74 | -------- | -------- | -------- | -------- |
| Whitefish | 400 | 20 | -------- | -------- | -------- | -------- | -------- | -------- |
| Yellowtail | 82,800 | 3,344 | 5,300 | 213 | -------- | -------- | -------- | -------- |
| Other fish | 100 | 3 | -------- | -------- | -------- | -------- | -------- | -------- |
| Total | 2,316,800 | 107,272 | 645,400 | 31,986 | 24,300 | 1,039 | 53,900 | 6,831 |
| SHELLFISH | | | | | | | | |
| Sea crawfish or spiny lobster | -------- | -------- | -------- | -------- | 54,400 | 10,212 | -------- | -------- |
| Grand total | 2,316,800 | 107,272 | 645,400 | 31,986 | 78,700 | 11,251 | 53,900 | 6,831 |

NOTE.—The catch by purse seines was made by fishermen from the San Pedro district.

*Fisheries of the San Diego district of California, 1938*—Continued

CATCH OFF LATIN AMERICA: BY GEAR

| Species | Purse seines | | Lampara and ring nets | | Gill nets | | Trammel nets | |
|---|---|---|---|---|---|---|---|---|
| FISH | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Barracuda | | | | | 43, 800 | $2, 698 | | |
| Flounders, "California halibut" | | | | | | | 243, 200 | $15, 771 |
| Pilchard or sardines | | | 100 | $1 | | | | |
| Rock bass | | | 900 | 48 | 600 | 36 | | |
| Rockfishes | | | | | 400 | 18 | 700 | 31 |
| Sea bass: | | | | | | | | |
| Black | | | | | 1, 400 | 78 | 1, 300 | 73 |
| White | | | 2, 900 | 216 | 150, 700 | 11, 191 | 400 | 28 |
| Sharks, including grayfish | | | | | 1, 000 | 18 | | |
| Sheepshead | | | | | | | 200 | 7 |
| Skates | | | | | | | 100 | 1 |
| Smelt | | | 600 | 35 | 300 | 22 | | |
| Tuna and tunalike fishes: | | | | | | | | |
| Bluefin | 103, 500 | $5, 694 | 481, 500 | 26, 674 | | | | |
| Bonito | | | 48, 700 | 1, 793 | | | 1, 500 | 62 |
| Skipjack or striped tuna | 47, 400 | 2, 370 | | | | | | |
| Yellowfin | 94, 000 | 5, 642 | | | | | | |
| Whitefish | | | | | | | 500 | 23 |
| Yellowtail | 24, 600 | 922 | 17, 000 | 636 | 900 | 38 | | |
| Other fish | | | | | | | 100 | 4 |
| Total | 269, 500 | 14, 628 | 551, 700 | 29, 403 | 199, 100 | 14, 099 | 248, 000 | 16, 000 |
| SHELLFISH | | | | | | | | |
| Squid | | | 200 | 11 | | | | |
| Grand total | 269, 500 | 14, 628 | 551, 900 | 29, 414 | 199, 100 | 14, 099 | 248, 000 | 16, 000 |

| Species | Lines | | | | Traps | | Harpoons | |
|---|---|---|---|---|---|---|---|---|
| | Set and hand | | Troll | | | | | |
| FISH | *Pounds* | *Value* | *Pound* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Barracuda | 340, 200 | $20, 957 | 110, 200 | $6, 789 | | | | |
| Cabrilla | 61, 100 | 2, 762 | | | | | | |
| Flounders, "California halibut" | 4, 100 | 267 | | | | | | |
| Groupers | 46, 500 | 2, 125 | | | | | | |
| Mackerel | 1, 000 | 19 | | | | | | |
| Rock bass | 21, 700 | 1, 199 | | | | | | |
| Rockfishes | 159, 100 | 7, 376 | | | | | | |
| Sculpin | 100 | 5 | | | | | | |
| Sea bass: | | | | | | | | |
| Black | 152, 200 | 8, 564 | | | | | | |
| White | 154, 200 | 11, 455 | 800 | 62 | | | | |
| Sharks, including grayfish | 9, 700 | 172 | | | | | | |
| Sheepshead | 9, 900 | 372 | | | | | | |
| Spanish mackerel | 5, 300 | 164 | | | | | | |
| Swordfish | | | | | | | 363, 500 | $36, 488 |
| Tuna and tunalike fishes: | | | | | | | | |
| Albacore | 21, 100 | 2, 069 | 8, 800 | 883 | | | | |
| Bluefin | 103, 400 | 5, 765 | | | | | | |
| Bonito | 444, 300 | 16, 343 | 9, 000 | 331 | | | | |
| Skipjack or striped tuna | 14, 820, 200 | 741, 008 | | | | | | |
| Yellowfin | 58, 699, 800 | 3, 526, 767 | | | | | | |
| Whitefish | 40, 800 | 1, 972 | | | | | | |
| Yellowtail | 4, 230, 500 | 159, 374 | 4, 200 | 167 | | | | |
| Other fish | 200 | 10 | | | | | | |
| Total | 79, 325, 400 | 4, 508, 745 | 133, 000 | 8, 232 | | | 363, 500 | 36, 488 |
| SHELLFISH | | | | | | | | |
| Sea crawfish or spiny lobster | | | | | 889, 600 | $117, 718 | | |
| Grand total | 79, 325, 400 | 4, 508, 745 | 133, 000 | 8, 232 | 889, 600 | 117, 718 | 363, 500 | 36, 488 |

NOTE.—The catch by purse seines was made by fishermen from the San Pedro district.

## HALIBUT FISHERY OF THE PACIFIC COAST[12]

The halibut fishery of the Pacific coast, which is prosecuted by United States (including Alaska) and Canadian vessels, ranks as one of the foremost fisheries of that section. During 1938 the total catch of halibut by vessels of both nationalities amounted to 48,549,000 pounds, valued at $3,487,000. This is a decrease of less than 1 percent in volume and 9 percent in value as compared with the catch and value in 1937. Of the total catch in 1938, 75 percent was taken by United States craft and 25 percent by Canadian craft. Considered according to ports of landing, 43 percent was landed at Seattle, Wash.; 40 percent at Canadian ports; and 17 percent at ports in Alaska.

*Halibut fishery of the Pacific coast, 1938*

UNITED STATES OPERATING UNITS: BY FLEET CLASSIFICATION

| Item | Washington fleet | Alaska fleet | Total |
|---|---|---|---|
| Regular halibut vessels: | | | |
| Number | 135 | 110 | 245 |
| Net tonnage | 4,009 | 1,570 | 5,579 |
| Crew | 1,049 | 514 | 1,563 |
| Skates of lines | 4,084 | 2,212 | 6,296 |
| Vessels in other fisheries but landing one or more fares of halibut: | | | |
| Number | 7 | 28 | 35 |
| Net tonnage | 227 | 266 | 493 |
| Crew | 53 | 98 | 151 |
| Skates of lines | 199 | 400 | 599 |
| Regular halibut boats: | | | |
| Number | | 28 | 28 |
| Crew | | 63 | 63 |
| Skates of lines | | 298 | 298 |
| Boats in other fisheries but landing one or more fares of halibut: | | | |
| Number | | 64 | 64 |
| Crew | | 128 | 128 |
| Skates of lines | | 512 | 512 |

CATCH OF ALL SPECIES: BY UNITED STATES VESSELS AND BOATS

| Fleet classification | Landed in— | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Seattle, Wash. | | British Columbia | | Alaska | | | |
| WASHINGTON FLEET | | | | | | | | |
| Regular vessels: | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Halibut | 19,703,208 | $1,641,989 | 2,254,633 | $160,177 | 338,832 | $20,897 | 22,296,673 | $1,823,063 |
| Sablefish | 2,608,475 | 109,273 | 11,014 | 326 | 877 | 20 | 2,620,366 | 109,619 |
| "Lingcod" | 1,228,062 | 43,975 | | | | | 1,228,062 | 43,975 |
| Rockfishes | 378,878 | 20,029 | | | | | 378,878 | 20,029 |
| Total | 23,918,623 | 1,815,266 | 2,265,647 | 160,503 | 339,709 | 20,917 | 26,523,979 | 1,996,686 |
| Other vessels and boats: | | | | | | | | |
| Halibut | 390,847 | 28,503 | 68,729 | 4,406 | 31,723 | 2,053 | 491,299 | 34,962 |
| Sablefish | 14,342 | 573 | | | | | 14,342 | 573 |
| "Lingcod" | 18,388 | 584 | | | | | 18,388 | 584 |
| Rockfishes | 708 | 30 | | | | | 708 | 30 |
| Total | 424,285 | 29,690 | 68,729 | 4,406 | 31,723 | 2,053 | 524,737 | 36,149 |

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[12] These statistics are compiled from data collected by the International Fisheries Commission for Washington and British Columbia and by Bureau agents for Alaska. The weights shown represent the poundage of fish landed after evisceration and removal of heads.

### *Halibut fishery of the Pacific coast, 1938*—Continued

CATCH OF ALL SPECIES: BY UNITED STATES VESSELS AND BOATS—Continued

| Fleet classification | Landed in— | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Seattle, Wash. | | British Columbia | | Alaska | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| ALASKA FLEET | | | | | | | | |
| Regular vessels: | | | | | | | | |
| Halibut | 633, 899 | $54, 882 | 4, 889, 314 | $351, 442 | 5, 560, 009 | $333,750 | 11, 083, 222 | $740, 074 |
| Sablefish | 111, 210 | 4, 414 | 526, 539 | 14, 902 | 819, 604 | 20, 147 | 1, 457, 353 | 39, 463 |
| "Lingcod" | 68, 816 | 3, 188 | | | 7, 655 | 191 | 76, 471 | 3, 379 |
| Rockfishes | 54, 523 | 2, 840 | | | 8, 573 | 196 | 63, 096 | 3, 036 |
| Total | 868, 448 | 65, 324 | 5, 415, 853 | 366, 344 | 6, 395, 841 | 354, 284 | 12, 680, 142 | 785, 952 |
| Other vessels and boats: | | | | | | | | |
| Halibut | 16, 201 | 1, 146 | 116, 589 | 8, 309 | 2, 340, 343 | 140, 772 | 2, 473, 133 | 150, 227 |
| Sablefish | | | | | 98, 708 | 2, 421 | 98, 708 | 2, 421 |
| "Lingcod" | 508 | 15 | | | 33, 123 | 828 | 33, 631 | 843 |
| Rockfishes | | | | | 16, 229 | 365 | 16, 229 | 365 |
| Total | 16, 709 | 1, 161 | 116, 589 | 8, 309 | 2, 488, 403 | 144, 386 | 2, 621, 701 | 153, 856 |
| COMBINED FLEETS | | | | | | | | |
| Regular vessels: | | | | | | | | |
| Halibut | 20, 337, 107 | 1, 696, 871 | 7, 143, 947 | 511, 619 | 5, 898, 841 | 354, 647 | 33, 379, 895 | 2, 563, 137 |
| Sablefish | 2, 719, 685 | 113, 687 | 537, 553 | 15, 228 | 820, 481 | 20, 167 | 4, 077, 719 | 149, 082 |
| "Lingcod" | 1, 296, 878 | 47, 163 | | | 7, 655 | 191 | 1, 304, 533 | 47, 354 |
| Rockfishes | 433, 401 | 22, 869 | | | 8, 573 | 196 | 441, 974 | 23, 065 |
| Total | 24, 787, 071 | 1, 880, 590 | 7, 681, 500 | 526, 847 | 6, 735, 550 | 375, 201 | 39, 204, 121 | 2, 782, 638 |
| Other vessels and boats: | | | | | | | | |
| Halibut | 407, 048 | 29, 649 | 185, 318 | 12, 715 | 2, 372, 066 | 142, 825 | 2, 964, 432 | 185, 189 |
| Sablefish | 14, 342 | 573 | | | 98, 708 | 2, 421 | 113. 050 | 2, 994 |
| "Lingcod" | 18, 896 | 599 | | | 33, 123 | 828 | 52, 019 | 1, 427 |
| Rockfishes | 708 | 30 | | | 16, 229 | 365 | 16, 937 | 395 |
| Total | 440, 994 | 30, 851 | 185, 318 | 12, 715 | 2, 520, 126 | 146, 439 | 3, 146, 438 | 190, 005 |
| All vessels and boats: | | | | | | | | |
| Halibut | 20, 744, 155 | 1, 726, 520 | 7, 329, 265 | 524, 334 | 8, 270, 907 | 497, 472 | 36, 344, 327 | 2, 748, 326 |
| Sablefish | 2, 734, 027 | 114, 260 | 537, 553 | 15, 228 | 919, 189 | 22, 588 | 4, 190, 769 | 152, 076 |
| "Lingcod" | 1, 315, 774 | 47, 762 | | | 40, 778 | 1, 019 | 1, 356, 552 | 48, 781 |
| Rockfishes | 434, 109 | 22, 899 | | | 24, 802 | 561 | 458, 911 | 23, 460 |
| Grand total | 25, 228, 065 | 1, 911, 441 | 7, 866, 818 | 539, 562 | 9, 255, 676 | 521, 640 | 42, 350, 559 | 2, 972, 643 |

*Halibut fishery of the Pacific coast, 1938*—Continued

CATCH OF HALIBUT: BY UNITED STATES AND CANADIAN VESSELS AND BOATS

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Fleet classification | Landed in— | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Seattle, Wash. | | British Columbia | | Alaska | | | |
| **WASHINGTON FLEET** | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Regular halibut vessels | 19,703 | $1,642 | 2,254 | $160 | 339 | $21 | 22,296 | $1,823 |
| Other vessels and boats | 391 | 28 | 69 | 4 | 32 | 2 | 492 | 34 |
| Total | 20,094 | 1,670 | 2,323 | 164 | 371 | 23 | 22,788 | 1,857 |
| **ALASKA FLEET** | | | | | | | | |
| Regular halibut vessels | 634 | 55 | 4,889 | 352 | 5,560 | 334 | 11,083 | 741 |
| Other vessels and boats | 16 | 1 | 117 | 8 | 2,340 | 141 | 2,473 | 150 |
| Total | 650 | 56 | 5,006 | 360 | 7,900 | 475 | 13,556 | 891 |
| **COMBINED FLEETS** | | | | | | | | |
| Regular halibut vessels | 20,337 | 1,696 | 7,144 | 511 | 5,899 | 355 | 33,380 | 2,562 |
| Other vessels and boats | 407 | 30 | 185 | 13 | 2,372 | 143 | 2,964 | 186 |
| Total | 20,744 | 1,726 | 7,329 | 524 | 8,271 | 498 | 36,344 | 2,748 |
| British Columbia fleet | 166 | 13 | 12,013 | 724 | 26 | 2 | 12,205 | 739 |
| Grand total | 20,910 | 1,739 | 19,342 | 1,248 | 8,297 | 500 | 48,549 | 3,487 |

NOTE.—In addition to the above, there were 1,091,261 pounds of halibut, sablefish, "lingcod" and rockfish livers valued at $514,169, landed by the combined fleets at Pacific coast ports during 1938. Halibut vessels in the combined fleets also landed 1,236,124 pounds of halibut and sablefish viscera valued at $123,613 during the same period.

The tabulation does not include landings at ports south of Seattle, Wash., which are normally less than 1 percent of the annual Pacific coast catch.

## VESSEL FISHERIES AT SEATTLE, WASH.

A total of 52,086,890 pounds of fishery products, valued at $3,329,227, were handled by Seattle wholesale dealers during 1938, exclusive of quantities received by transporting vessels or by rail from Alaska or Canada. This represents a decrease of one-half of 1 percent in volume and 9 percent in value as compared with the quantity and value of the products handled during the preceding year. Of the total quantity handled, 25,228,065 pounds, valued at $1,911,441, were landed by halibut vessels—a decrease of less than one-half of 1 percent in volume and 10 percent in value as compared with the previous year. Receipts by wholesale dealers from sources other than Alaska or Canada, or from vessels in the halibut fleet, amounted to 26,858,825 pounds, valued at $1,417,786, which is a decrease of 1 percent in volume and 8 percent in value.

*Fishery products landed by United States vessels at Seattle, Wash., 1938* [1]

BY FISHING GROUNDS

| Fishing grounds | Trips | Halibut | | | | Sablefish | | "Lingcod" | | Rockfishes | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No. 1 | | No. 2 | | | | | | | | | |
| | *Number* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| West of Cape Spencer | 416 | 9, 085, 493 | $808, 820 | 5, 540, 967 | $466, 581 | 27, 581 | $1, 096 | 3, 329 | $98 | 5, 959 | $181 | 14, 663, 329 | $1, 276, 776 |
| South of Cape Spencer | 754 | 2, 494, 147 | 213, 961 | 3, 623, 548 | 237, 158 | 2, 706, 446 | 113, 164 | 1, 312, 445 | 47, 664 | 428, 150 | 22, 718 | 10, 564, 736 | 634, 665 |
| Total | 1, 170 | 11, 579, 640 | 1, 022, 781 | 9, 164, 515 | 703, 739 | 2, 734, 027 | 114, 260 | 1, 315, 774 | 47, 762 | 434, 109 | 22, 899 | 25, 228, 065 | 1, 911, 441 |

BY MONTHS

| Months | Trips | Halibut | | | | Sablefish | | "Lingcod" | | Rockfishes | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No. 1 | | No. 2 | | | | | | | | | |
| | *Number* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| January | 39 | | | | | 20, 217 | $716 | 150, 042 | $9, 247 | 62, 492 | $4, 070 | 232, 751 | $14, 033 |
| February | 46 | | | | | 51, 766 | 2, 007 | 276, 546 | 12, 103 | 90, 440 | 4, 476 | 418, 752 | 18, 586 |
| March | 35 | | | | | 57, 662 | 2, 443 | 257, 310 | 5, 944 | 107, 317 | 4, 418 | 422, 289 | 12, 805 |
| April | 147 | 2, 047, 707 | $158, 019 | 1, 133, 863 | $74, 346 | 6, 001 | 182 | 98, 360 | 3, 442 | 5, 745 | 209 | 3, 291, 676 | 236, 198 |
| May | 136 | 1, 605, 575 | 132, 696 | 1, 277, 256 | 79, 482 | 6, 288 | 339 | 106, 604 | 3, 224 | 9, 155 | 279 | 3, 004, 878 | 216, 020 |
| June | 172 | 1, 876, 066 | 145, 244 | 1, 792, 187 | 116, 271 | 147, 101 | 7, 031 | 125, 322 | 2, 970 | 11, 901 | 345 | 3, 952, 577 | 271, 861 |
| July | 160 | 1, 823, 944 | 149, 539 | 1, 673, 876 | 124, 565 | 180, 196 | 7, 238 | 45, 564 | 1, 365 | 11, 624 | 387 | 3, 735, 204 | 283, 094 |
| August | 118 | 1, 487, 250 | 139, 633 | 1, 121, 923 | 94, 700 | 437, 266 | 18, 096 | 54, 658 | 1, 529 | 33, 994 | 1, 354 | 3, 135, 091 | 255, 312 |
| September | 133 | 1, 454, 355 | 152, 141 | 1, 015, 616 | 96, 152 | 801, 632 | 33, 114 | 66, 765 | 2, 080 | 18, 093 | 639 | 3, 356, 461 | 284, 126 |
| October | 131 | 890, 865 | 101, 899 | 774, 005 | 80, 394 | 775, 858 | 32, 620 | 97, 825 | 3, 889 | 30, 144 | 4, 124 | 2, 568, 697 | 222, 926 |
| November | 53 | 393, 878 | 43, 610 | 375, 789 | 37, 829 | 250, 040 | 10, 474 | 36, 778 | 1, 969 | 53, 204 | 2, 598 | 1, 109, 689 | 96, 480 |
| Total | 1, 170 | 11, 579, 640 | 1, 022, 781 | 9, 164, 515 | 703, 739 | 2, 734, 027 | 114, 260 | 1, 315, 774 | 47, 762 | 434, 109 | 22, 899 | 25, 228, 065 | 1, 911, 441 |

[1] Halibut fleet.

NOTE.—There were no landings by the fleet in December due to a fishermen's strike.
The statistics in this table are compiled from reports collected by the Bureau of Fisheries and the International Fisheries Commission.

*Fishery products received by Seattle wholesale dealers, 1938; by months*[1]

| Species | January | | February | | March | | April | | May | | June | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod | 132, 384 | $3, 694 | 65, 995 | $2, 612 | 67, 517 | $1, 802 | 51, 245 | $1, 291 | 3, 687 | $45 | 6, 640 | $87 |
| Flounders: | | | | | | | | | | | | |
| "Sole" | 229, 131 | 9, 165 | 210, 978 | 8, 461 | 156, 095 | 6, 327 | 256, 756 | 9, 462 | 491, 345 | 13, 420 | 335, 332 | 8, 561 |
| Other | 218, 020 | 5, 451 | 110, 622 | 2, 803 | 54, 106 | 1, 402 | 20, 221 | 541 | 795 | 12 | 1, 509 | 20 |
| Halibut | | | | | | | 32, 142 | 2, 840 | 42, 272 | 2, 540 | 87, 132 | 4, 332 |
| Herring | 24, 600 | 294 | 259, 711 | 4, 470 | 393, 653 | 4, 056 | 46, 200 | 347 | | | | |
| "Lingcod" | 26, 188 | 903 | 48, 959 | 1, 922 | 43, 792 | 1, 486 | 148, 670 | 3, 214 | 148, 263 | 1, 951 | 227, 234 | 2, 338 |
| Perch | 12, 370 | 434 | 13, 482 | 501 | 15, 802 | 513 | 25, 859 | 758 | 10, 851 | 268 | 2, 941 | 74 |
| Rockfishes | 14, 417 | 447 | 17, 588 | 484 | 14, 651 | 230 | 40, 255 | 750 | 15, 465 | 276 | 23, 214 | 707 |
| Sablefish | | | | | | | | | | | 5, 665 | 133 |
| Salmon: | | | | | | | | | | | | |
| Chinook or king | | | 15, 808 | 2, 667 | 126, 339 | 17, 730 | 316, 131 | 40, 438 | 316, 444 | 37, 665 | 416, 752 | 46, 281 |
| Silver or coho | | | | | | | 127 | 12 | 34, 789 | 2, 365 | 68, 450 | 5, 803 |
| Smelt | 8, 068 | 663 | 5, 603 | 391 | 350 | 21 | 350 | 11 | 16, 892 | 1, 539 | 43, 098 | 1, 724 |
| Crabs | 108, 588 | 7, 054 | 157, 118 | 8, 426 | 168, 205 | 9, 189 | 167, 185 | 6, 250 | 172, 523 | 6, 347 | 107, 985 | 5, 026 |
| Shrimp | | | | | | | 3, 868 | 638 | 1, 486 | 266 | 796 | 144 |
| Clams, hard, in shell (meats) | 42, 047 | 3, 670 | 33, 308 | 2, 984 | 46, 669 | 4, 764 | 50, 333 | 4, 910 | 2, 864 | 296 | | |
| Scallops, bay (meats) | 1, 580 | 397 | 1, 803 | 395 | 1, 903 | 485 | 1, 844 | 464 | 1, 569 | 392 | 1, 425 | 356 |
| Octopus | 5, 383 | 289 | 4, 375 | 215 | 5, 123 | 188 | 4, 910 | 229 | 7, 627 | 397 | 2, 966 | 119 |
| Total | 822, 776 | 32, 461 | 945, 350 | 36, 331 | 1, 091, 205 | 48, 193 | 1, 166, 096 | 72, 155 | 1, 266, 872 | 67, 779 | 1, 331, 139 | 75, 705 |

| Species | July | | August | | September | | October | | November | | December | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod | 1, 352 | $18 | 2, 252 | $24 | 5, 048 | $56 | 14, 677 | $194 | 20, 631 | $428 | 60, 798 | $1, 676 | 432, 226 | $11, 927 |
| Flounders: | | | | | | | | | | | | | | |
| "Sole" | 495, 861 | 12, 437 | 543, 112 | 13, 574 | 516, 938 | 12, 923 | 155, 748 | 4, 136 | 81, 319 | 2, 514 | 116, 077 | 4, 558 | 3, 588, 692 | 105, 538 |
| Other | 140 | 2 | 178 | 2 | 366 | 3 | 442 | 7 | 19, 092 | 380 | 34, 405 | 831 | 459, 896 | 11, 454 |
| Halibut | 95, 825 | 5, 675 | 28, 892 | 1, 807 | 1, 049 | 105 | 755 | 65 | | | | | 288, 067 | 17, 364 |
| Herring | | | | | | | | | | | 3, 265 | 63 | 727, 429 | 9, 230 |
| "Lingcod" | 271, 865 | 3, 187 | 293, 282 | 3, 035 | 102, 084 | 2, 202 | 45, 223 | 766 | 31, 623 | 700 | 44, 537 | 1, 352 | 1, 431, 720 | 23, 056 |
| Perch | 90 | 2 | 4, 518 | 132 | 9, 110 | 274 | 6, 449 | 193 | 7, 272 | 235 | 13, 187 | 476 | 121, 931 | 3, 860 |
| Rockfishes | 6, 962 | 207 | 4, 555 | 103 | 5, 288 | 109 | 8, 250 | 306 | 4, 812 | 172 | 19, 325 | 764 | 174, 782 | 4, 555 |
| Sablefish | 21, 889 | 453 | 35, 847 | 822 | 11, 236 | 238 | 6, 505 | 136 | | | | | 81, 142 | 1, 782 |
| Salmon: | | | | | | | | | | | | | | |
| Blueback, red, or sockeye | 192 | 19 | 184, 855 | 13, 129 | 12, 898 | 954 | | | | | | | 197, 945 | 14, 102 |
| Chinook or king | 726, 570 | 82, 443 | 1, 117, 169 | 139, 322 | 1, 668, 599 | 115, 806 | 351, 535 | 38, 360 | 34, 799 | 3, 904 | 37 | 2 | 5, 090, 183 | 524, 618 |
| Chum or keta | | | 2, 508 | 130 | 9, 202 | 231 | 3, 966, 473 | 99, 162 | 1, 718, 097 | 59, 892 | 200 | 4 | 5, 696, 480 | 159, 419 |
| Humpback or pink | | | 159 | 5 | | | | | | | | | 159 | 5 |
| Silver or coho | 212, 339 | 19, 169 | 1, 025, 055 | 78, 045 | 1, 390, 381 | 97, 358 | 1, 996, 919 | 129, 282 | 124, 054 | 7, 784 | 17, 105 | 1, 284 | 4, 869, 219 | 311, 102 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Smelt | 48, 160 | 1, 795 | 88, 674 | 3, 166 | 39, 745 | 1, 790 | 32, 632 | 1, 958 | 22, 293 | 1, 759 | 14, 929 | 1, 194 | 320, 794 | 16, 011 |
| Tuna, albacore | -------- | -------- | 245, 783 | 11, 674 | 626, 289 | 27, 743 | 320, 023 | 14, 142 | -------- | -------- | -------- | -------- | 1, 192, 095 | 53, 559 |
| Crabs | 152, 460 | 6, 998 | 107, 604 | 4, 890 | 67, 384 | 3, 370 | 157, 844 | 6, 354 | 194, 234 | 7, 982 | 191, 782 | 7, 182 | [2] 1, 752, 912 | 79, 068 |
| Shrimp | 563 | 48 | 116 | 21 | 250 | 20 | -------- | -------- | 1, 813 | 196 | 7, 485 | 1, 028 | 16, 377 | 2, 361 |
| Clams, hard, in shell (meats) | -------- | -------- | -------- | -------- | 38, 025 | 3, 418 | 42, 650 | 3, 822 | 39, 200 | 3, 512 | 36, 575 | 3, 290 | 331, 671 | 30, 666 |
| Scallops, bay (meats) | 1, 949 | 487 | 2, 395 | 598 | 1, 140 | 292 | 1, 603 | 408 | 996 | 250 | 1, 401 | 356 | 19, 608 | 4, 880 |
| Octopus | 2, 672 | 134 | 3, 163 | 155 | 3, 364 | 168 | 5, 848 | 268 | 5, 067 | 219 | 9, 661 | 477 | 60, 159 | 2, 858 |
| Squid | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 1, 390 | 110 | 3, 948 | 261 | 5, 338 | 371 |
| Total | 2, 038, 889 | 133, 074 | 3, 690, 117 | 270, 634 | 4, 508, 396 | 267, 060 | 7, 113, 576 | 299, 559 | 2, 306, 692 | 90, 037 | 574, 717 | 24, 798 | 26, 858, 825 | 1, 417, 786 |

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[1] This tabulation does not include fish received from Alaska or Canada or vessels in the halibut fleet.

[2] 81,444 dozen.

NOTE.—The yields of bivalve mollusks have been converted from weights in the shell to weight of meats on the following bases: Hard clams, 25 percent, and bay scallops, 17 percent.

## LAKE FISHERIES [13]

In 1938 the yield of the fisheries of the Great Lakes, including those of the international lakes of northern Minnesota, in the United States and Canada amounted to 112,633,700 pounds, representing a decrease of 3 percent as compared with the catch in the preceding year.

Considering the fishery of United States craft only, the catch amounted to 81,524,500 pounds, valued at $6,083,212, which is a decrease of 3 percent in volume but an increase of 1 percent in value as compared with the catch in the previous year. These fisheries gave employment to 6.976 fishermen, as compared with 6,418 in the previous year.

*Lake fisheries of the United States and Canada, 1938*

CATCH: BY LAKES

| Species | Lake Ontario | | | Lake Erie | | |
|---|---|---|---|---|---|---|
| | United States | Canada | Total | United States | Canada | Total |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Blue pike | 58, 500 | 59, 500 | 118, 000 | 8, 659, 400 | 7, 157, 700 | 15, 817, 100 |
| Bowfin | 1, 700 | (1) | 1, 700 | 2, 800 | (1) | 2, 800 |
| Burbot | 19, 000 | (1) | 19, 000 | 262, 600 | (1) | 262, 600 |
| Carp | 134, 700 | 144, 200 | 278, 900 | 2, 209, 500 | 373, 900 | 2, 583, 400 |
| Catfish and bullheads | 52, 200 | 191, 200 | 243, 400 | 463, 800 | 78, 300 | 542, 100 |
| Cisco | 36, 100 | (1) | 36, 100 | 809, 700 | 1, 374, 500 | 2, 184, 200 |
| Eels, common | 44, 300 | 42, 300 | 86, 600 | | | |
| Garfish | | | | 5, 900 | (1) | 5, 900 |
| Goldfish | | | | 214, 700 | (1) | 214, 700 |
| Lake herring | 6, 200 | 1, 230, 600 | 1, 236, 800 | | | |
| Lake trout | 16, 900 | 275, 800 | 292, 700 | 100 | (1) | 100 |
| Mooneye | | | | 11, 300 | (1) | 11, 300 |
| Pike or pickerel (jacks) | 10, 900 | 104, 600 | 115, 500 | 3, 200 | 20, 200 | 23, 400 |
| Rock bass | 4, 400 | (1) | 4, 400 | 3, 400 | (1) | 3, 400 |
| Sauger | | | | 844, 400 | (1) | 844, 400 |
| Sheepshead | | | | 3, 392, 300 | (1) | 3, 392, 300 |
| Sturgeon | 10, 500 | 5, 300 | 15, 800 | 20, 300 | 16, 500 | 36, 800 |
| Sucker "mullet" | 128, 600 | (1) | 128, 600 | 756, 000 | (1) | 756, 000 |
| Sunfish | 44, 100 | (1) | 44, 100 | | | |
| White bass | 5, 000 | (1) | 5, 000 | 727, 300 | (1) | 727, 300 |
| Whitefish, common | 55, 800 | 602, 300 | 658, 100 | 910, 900 | 1, 001, 800 | 1, 912, 700 |
| Yellow perch | 58, 400 | 169, 400 | 227, 800 | 5, 186, 900 | 2, 595, 500 | 7, 782, 400 |
| Yellow pike | 2, 200 | 15, 000 | 17, 200 | 3, 134, 600 | 509, 500 | 3, 644, 100 |
| Miscellaneous | | 245, 800 | 245, 800 | | 1, 373, 100 | 1, 373, 100 |
| Total | 689, 500 | 3, 086, 000 | 3, 775, 500 | 27, 619. 100 | 14, 501, 000 | 42, 120, 100 |

[1] Where there has been a Canadian catch of these species it is included under "Miscellaneous."

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[13] The statistics of the catch presented herewith were obtained principally from records of the various State fishery agencies. The data for the operating units (fishermen, vessels, boats, and gear) of the United States were obtained largely by Bureau agents in a special canvass; although State records in several instances were very helpful in this work. In all cases the statistics collected are for the calendar year, except for Lake of the Woods, Rainy Lake, and Lake Namakan in Minnesota, which are for 2 seasons. For Lake of the Woods, the seasons are from June 1 to November 1 and December 1 to April 1, and for Rainy and Namakan Lakes from May 15 to November 1 and December 1 to April 1. The catches for these 2 seasons, in the order named, have been combined to constitute a year. The quantity of fish taken in these lakes between January 1 and April 1 is estimated at less than 3 percent of the total catch.

## *Lake fisheries of the United States and Canada, 1938*—Continued

### CATCH: BY LAKES—Continued

| Species | Lake Huron | | | Lake Michigan | Lake Superior | | |
|---|---|---|---|---|---|---|---|
| | United States | Canada | Total | United States | United States | Canada | Total |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Blue pike | | 2,000 | 2,000 | | | 14,200 | 14,200 |
| Bowfin | 1,100 | (1) | 1,100 | | | | |
| Burbot | 12,000 | (1) | 12,000 | 34,300 | 8,500 | (1) | 8,500 |
| Carp | 631,100 | 49,100 | 680,200 | 1,873,000 | 300 | 600 | 900 |
| Catfish and bullheads | 165,700 | 10,600 | 176,300 | 67,600 | | | |
| Chubs | 192,100 | 452,000 | 644,100 | 5,404,100 | 256,300 | 61,900 | 318,200 |
| Lake herring | 5,428,800 | 235,700 | 5,664,500 | 4,477,300 | 10,593,700 | 1,855,500 | 12,449,200 |
| Lake trout | 1,270,100 | 3,800,300 | 5,070,400 | 4,905,600 | 3,166,900 | 1,667,800 | 4,834,700 |
| Pike or pickerel (jacks) | 25,500 | 128,700 | 154,200 | 18,400 | 5,100 | 8,200 | 13,300 |
| Rock bass | 27,900 | (1) | 27,900 | 2,600 | | | |
| Sauger | 2,100 | (1) | 2,100 | 400 | | | |
| Sheepshead | 19,800 | (1) | 19,800 | 4,600 | | | |
| Smelt | 100 | (1) | 100 | 1,841,400 | 4,300 | (1) | 4,300 |
| Steelhead trout | | | | 1,200 | | | |
| Sturgeon | | 12,500 | 12,500 | | | 2,600 | 2,600 |
| Sucker "mullet" | 1,788,200 | (1) | 1,788,200 | 1,858,100 | 288,700 | (1) | 288,700 |
| White bass | | | | 3,400 | | | |
| Whitefish: | | | | | | | |
| Common | 558,000 | 1,587,100 | 2,145,100 | 1,258,900 | 455,400 | 311,700 | 767,100 |
| Menominee | 54,200 | (1) | 54,200 | 75,700 | 23,500 | (1) | 23,500 |
| Yellow perch | 500,400 | 151,800 | 652,200 | 2,203,600 | 7,900 | 700 | 8,600 |
| Yellow pike | 1,356,100 | 358,500 | 1,714,600 | 49,600 | 45,400 | 75,500 | 120,900 |
| Crawfish | | | | 6,000 | | | |
| Mussel shells | 5,500 | (1) | 5,500 | 293,500 | | | |
| Miscellaneous | | 469,000 | 469,000 | | | 58,500 | 58,500 |
| Total | 12,038,700 | 7,257,300 | 19,296,000 | 24,379,300 | 14,856,000 | 4,057,200 | 18,913,200 |

| Species | Namakan Lake | | | Rainy Lake | | |
|---|---|---|---|---|---|---|
| | United States | Canada | Total | United States | Canada | Total |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Blue pike | | | | | 700 | 700 |
| Burbot | | | | 1,700 | (1) | 1,700 |
| Chubs | | | | | 14,700 | 14,700 |
| Lake herring | | | | 14,000 | (1) | 14,000 |
| Pike or pickerel (jacks) | 2,500 | 3,800 | 6,300 | 27,600 | 101,100 | 128,700 |
| Sturgeon | | 500 | 500 | 100 | 700 | 800 |
| Sucker "mullet" | | | | 2,000 | (1) | 2,000 |
| Whitefish, common | 30,500 | 9,300 | 39,800 | 29,300 | 66,100 | 95,400 |
| Yellow perch | | | | 6,000 | 10,700 | 16,700 |
| Yellow pike | 9,500 | 5,900 | 15,400 | 38,900 | 182,800 | 221,700 |
| Miscellaneous | | | | | 90,900 | 90,900 |
| Total | 42,500 | 19,500 | 62,000 | 119,600 | 467,700 | 587,300 |

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[1] Where there has been a Canadian catch of these species it is included under "Miscellaneous."

## *Lake fisheries of the United States and Canada, 1938*—Continued

### CATCH: BY LAKES—Continued

| Species | Lake of the Woods |  |  | Total, all lakes |  |  |
|---|---|---|---|---|---|---|
|  | United States | Canada | Total | United States | Canada | Total |
|  | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Blue pike |  |  |  | 8,717,900 | 7,234,100 | 15,952,000 |
| Bowfin |  |  |  | 5,600 | (1) | 5,600 |
| Burbot | 19,800 | (1) | 19,800 | 357,900 | (1) | 357,900 |
| Carp | 11,000 | 1,300 | 12,300 | 4,859,600 | 569,100 | 5,428,700 |
| Catfish and bullheads | 41,300 | 8,400 | 49,700 | 790,600 | 288,500 | 1,079,100 |
| Chubs |  |  |  | 5,852,500 | 528,600 | 6,381,100 |
| Cisco |  |  |  | 845,800 | 1,374,500 | 2,220,300 |
| Crappie | 400 | (1) | 400 | 400 | (1) | 400 |
| Eels, common |  |  |  | 44,300 | 42,300 | 86,600 |
| Garfish |  |  |  | 5,900 | (1) | 5,900 |
| Goldfish |  |  |  | 214,700 | (1) | 214,700 |
| Lake herring | 2,900 | (1) | 2,900 | 20,522,900 | 3,321,800 | 23,844,700 |
| Lake trout |  | 6,300 | 6,300 | 9,359,600 | 5,750,200 | 15,109,800 |
| Mooneye |  |  |  | 11,300 | (1) | 11,300 |
| Pike or pickerel (jacks) | 137,900 | 425,200 | 563,100 | 231,100 | 791,800 | 1,022,900 |
| Rock bass |  |  |  | 38,300 | (1) | 38,300 |
| Sauger | 87,900 | 43,900 | 131,800 | 934,800 | 43,900 | 978,700 |
| Sheepshead |  |  |  | 3,416,700 | (1) | 3,416,700 |
| Smelt |  |  |  | 1,845,800 | (1) | 1,845,800 |
| Steelhead trout |  |  |  | 1,200 | (1) | 1,200 |
| Sturgeon |  |  |  | 30,900 | 38,100 | 69,000 |
| Sucker "mullet" | 180,300 | 300 | 180,600 | 5,001,900 | 300 | 5,002,200 |
| Sunfish |  |  |  | 44,100 | (1) | 44,100 |
| Tullibees | 878,400 | 112,200 | 990,600 | 878,400 | 112,200 | 990,600 |
| White bass |  |  |  | 735,700 | (1) | 735,700 |
| Whitefish: |  |  |  |  |  |  |
| Common | 3,700 | 192,400 | 196,100 | 3,302,500 | 3,770,700 | 7,073,200 |
| Menominee |  |  |  | 153,400 | (1) | 153,400 |
| Yellow perch | 53,600 | 25,800 | 79,400 | 8,016,800 | 2,953,900 | 10,970,700 |
| Yellow pike | 362,600 | 651,500 | 1,014,100 | 4,998,900 | 1,798,700 | 6,797,600 |
| Crawfish |  |  |  | 6,000 | (1) | 6,000 |
| Mussel shells |  |  |  | 299,000 | (1) | 299,000 |
| Miscellaneous |  | 253,200 | 253,200 |  | 2,490,500 | 2,490,500 |
| Total | 1,779,800 | 1,720,500 | 3,500,300 | 81,524,500 | 31,109,200 | 112,633,700 |

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(1) Where there has been a Canadian catch of these species it is included under "Miscellaneous."

## *Lake fisheries of the United States, 1938*

### OPERATING UNITS: BY LAKES

| Item | Lake Ontario | Lake Erie | Lake Huron | Lake Michigan | Lake Superior | Lake of the Woods, Rainy Lake, and Namakan Lake | Total |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 11 | 264 | 121 | 1,031 | 189 |  | 1,616 |
| On boats and shore: |  |  |  |  |  |  |  |
| Regular | 36 | 787 | 699 | 918 | 853 | 120 | 3,413 |
| Casual | 120 | 420 | 134 | 953 | 318 | 2 | 1,947 |
| Total | 167 | 1,471 | 954 | 2,902 | 1,360 | 122 | 6,976 |
| Vessels: |  |  |  |  |  |  |  |
| Steam |  | 13 | 5 | 22 | 4 |  | 44 |
| Net tonnage |  | 305 | 81 | 499 | 134 |  | 1,019 |
| Motor | 3 | 39 | 28 | 296 | 59 |  | 425 |
| Net tonnage | 33 | 433 | 448 | 3,499 | 590 |  | 5,003 |
| Total vessels | 3 | 52 | 33 | 318 | 63 |  | 469 |
| Total net tonnage | 33 | 738 | 529 | 3,998 | 724 |  | 6,022 |
| Boats: |  |  |  |  |  |  |  |
| Motor | 44 | 304 | 260 | 447 | 512 | 95 | 1,662 |
| Other | 72 | 383 | 253 | 545 | 379 | 27 | 1,659 |

## *Lake fisheries of the United States, 1938*—Continued

### OPERATING UNITS: BY LAKES—Continued

| Item | Lake Ontario | Lake Erie | Lake Huron | Lake Michigan | Lake Superior | Lake of the Woods, Rainy Lake, and Namakan Lake | Total |
|---|---|---|---|---|---|---|---|
| Apparatus: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Haul seines | 7 | 173 | 69 | 59 | 17 | --------- | 325 |
| Length, yards | 583 | 74,416 | 33,605 | 27,233 | 3,404 | --------- | 139,241 |
| Gill nets: | | | | | | | |
| "Shoal," 2¼ to 3⅜ inches | 1,337 | 21,740 | 2,870 | 64,588 | 11,939 | --------- | 102,474 |
| Square yards | 218,070 | 3,435,000 | 574,000 | 12,859,300 | 3,147,600 | --------- | 20,233,970 |
| "Shoal," 4 to 6 inches | 483 | 11,286 | 5,975 | 43,972 | 12,669 | 266 | 74,651 |
| Square yards | 90,330 | 2,246,850 | 1,337,500 | 9,584,000 | 3,702,010 | 84,384 | 17,045,074 |
| "Shoal," 10 to 14 inches | 34 | 8 | --------- | --------- | --------- | --------- | 42 |
| Square yards | 10,200 | 2,400 | --------- | --------- | --------- | --------- | 12,600 |
| Bar nets | --------- | 110 | --------- | --------- | --------- | --------- | 110 |
| Square yards | --------- | 16,500 | --------- | --------- | --------- | --------- | 16,500 |
| Trammel nets | --------- | --------- | --------- | 6 | --------- | --------- | 6 |
| Square yards | --------- | --------- | --------- | 600 | --------- | --------- | 600 |
| Lines: | | | | | | | |
| Troll | --------- | --------- | --------- | --------- | 75 | --------- | 75 |
| Hooks | --------- | --------- | --------- | --------- | 525 | --------- | 525 |
| Trot | 83 | 116 | 636 | 7,907 | 5,202 | --------- | 13,944 |
| Hooks | 16,600 | 25,200 | 189,900 | 2,403,450 | 1,049,575 | --------- | 3,684,725 |
| Pound nets | --------- | 45 | 449 | 1,093 | 232 | 69 | 1,888 |
| Trap nets | 140 | 6,105 | 3,066 | --------- | --------- | --------- | 9,311 |
| Fyke nets | 145 | 794 | 276 | 1,564 | 53 | 93 | 2,905 |
| Crawfish pots | --------- | --------- | --------- | 740 | --------- | --------- | 740 |
| Crowfoot bars | --------- | --------- | --------- | 62 | --------- | --------- | 62 |
| Picks | --------- | --------- | --------- | 19 | --------- | --------- | 19 |

### OPERATING UNITS: BY STATES AND LAKES

| Item | New York | | | Pennsylvania | Ohio |
|---|---|---|---|---|---|
| | Lake Ontario | Lake Erie | Total | Lake Erie | Lake Erie |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 11 | 49 | 60 | 133 | 82 |
| On boats and shore: | | | | | |
| Regular | 36 | 47 | 83 | 35 | 616 |
| Casual | 120 | 94 | 214 | 15 | 255 |
| Total | 167 | 190 | 357 | 183 | 953 |
| Vessels: | | | | | |
| Steam | --------- | 1 | 1 | 9 | 3 |
| Net tonnage | --------- | 24 | 24 | 185 | 96 |
| Motor | 3 | 9 | 12 | 16 | 14 |
| Net tonnage | 33 | 68 | 101 | 189 | 176 |
| Total vessels | 3 | 10 | 13 | 25 | 17 |
| Total net tonnage | 33 | 92 | 125 | 374 | 272 |
| Boats: | | | | | |
| Motor | 44 | 26 | 70 | 16 | 242 |
| Other | 72 | 44 | 116 | 1 | 291 |
| Apparatus: | | | | | |
| Haul seines | 7 | 6 | 13 | --------- | 133 |
| Length, yards | 583 | 516 | 1,099 | --------- | 64,300 |
| Gill nets: | | | | | |
| "Shoal," 2¼ to 3⅜ inches | 1,337 | 6,300 | 7,637 | 9,060 | 6,175 |
| Square yards | 218,070 | 1,160,000 | 1,378,070 | 1,395,000 | 839,000 |
| "Shoal," 4 to 6 inches | 483 | 3,218 | 3,701 | 6,150 | 1,763 |
| Square yards | 90,330 | 643,600 | 733,930 | 1,230,000 | 342,250 |
| "Shoal," 10 to 14 inches | 34 | 8 | 42 | --------- | --------- |
| Square yards | 10,200 | 2,400 | 12,600 | --------- | --------- |
| Bar nets | --------- | --------- | --------- | --------- | 110 |
| Square yards | --------- | --------- | --------- | --------- | 16,500 |
| Lines: | | | | | |
| Trot | 83 | 96 | 179 | --------- | --------- |
| Hooks | 16,600 | 19,200 | 35,800 | --------- | --------- |
| Pound nets | --------- | --------- | --------- | 45 | --------- |
| Trap nets | 140 | 16 | 156 | --------- | 5,900 |
| Fyke nets | 145 | --------- | 145 | --------- | 509 |

## *Lake fisheries of the United States, 1938*—Continued

### OPERATING UNITS: BY STATES AND LAKES—Continued

| Item | Michigan | | | | | Indiana |
|---|---|---|---|---|---|---|
| | Lake Erie | Lake Huron | Lake Michigan | Lake Superior | Total | Lake Michigan |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | ---------- | 121 | 370 | 107 | 598 | 29 |
| On boats and shore: | | | | | | |
| Regular | 89 | 699 | 403 | 325 | 1, 516 | 16 |
| Casual | 56 | 134 | 275 | 162 | 627 | 12 |
| Total | 145 | 954 | 1, 048 | 594 | 2, 741 | 57 |
| Vessels: | | | | | | |
| Steam | ---------- | 5 | 8 | 4 | 17 | 1 |
| Net tonnage | ---------- | 81 | 111 | 134 | 326 | 22 |
| Motor | ---------- | 28 | 96 | 25 | 149 | 8 |
| Net tonnage | ---------- | 448 | 1, 090 | 323 | 1, 861 | 87 |
| Total vessels | ---------- | 33 | 104 | 29 | 166 | 9 |
| Total net tonnage | ---------- | 529 | 1, 201 | 457 | 2, 187 | 109 |
| Boats: | | | | | | |
| Motor | 20 | 260 | 207 | 222 | 709 | 6 |
| Other | 47 | 253 | 169 | 90 | 559 | 5 |
| Apparatus: | | | | | | |
| Haul seines | 34 | 69 | 1 | 15 | 119 | 1 |
| Length, yards | 9, 600 | 33, 605 | 65 | 2, 904 | 46, 174 | 300 |
| Gill nets: | | | | | | |
| "Shoal," 2¼ to 3⅞ inches | 205 | 2, 870 | 17, 682 | 4, 850 | 25, 607 | 1, 575 |
| Square yards | 41, 000 | 574, 000 | 3, 469, 900 | 863, 000 | 4, 947, 900 | 315, 000 |
| "Shoal," 4 to 6 inches | 155 | 5, 975 | 21, 189 | 7, 365 | 34, 684 | 925 |
| Square yards | 31, 000 | 1, 337, 500 | 4, 604, 900 | 2, 129, 500 | 8, 102, 900 | 185, 000 |
| Lines: | | | | | | |
| Troll | ---------- | ---------- | ---------- | 75 | 75 | ---------- |
| Hooks | ---------- | ---------- | ---------- | 525 | 525 | ---------- |
| Trot | 20 | 636 | 510 | 3, 247 | 4, 413 | ---------- |
| Hooks | 6, 000 | 189, 900 | 155, 400 | 729, 100 | 1, 080, 400 | ---------- |
| Pound nets | ---------- | 449 | 744 | 136 | 1, 329 | 4 |
| Trap nets | 189 | 3, 066 | ---------- | ---------- | 3, 255 | ---------- |
| Fyke nets | 285 | 276 | 100 | 6 | 667 | ---------- |
| Crowfoot bars | ---------- | ---------- | 47 | ---------- | 47 | ---------- |
| Picks | ---------- | ---------- | 19 | ---------- | 19 | ---------- |

## *Lake fisheries of the United States, 1938*—Continued

### OPERATING UNITS: BY STATES AND LAKES—Continued

| Item | Illinois | Wisconsin | | | Minnesota | | |
|---|---|---|---|---|---|---|---|
| | Lake Michigan | Lake Michigan | Lake Superior | Total | Lake Superior | Lake of the Woods, Rainy Lake, and Namakan Lake | Total |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 69 | 563 | 76 | 639 | 6 | ---- | 6 |
| On boats and shore: | | | | | | | |
| Regular | 2 | 497 | 141 | 638 | 387 | 120 | 507 |
| Casual | 3 | 663 | 65 | 728 | 91 | 2 | 93 |
| Total | 74 | 1,723 | 282 | 2,005 | 484 | 122 | 606 |
| Vessels: | | | | | | | |
| Steam | ---- | 13 | ---- | 13 | ---- | ---- | ---- |
| Net tonnage | ---- | 366 | ---- | 366 | ---- | ---- | ---- |
| Motor | 21 | 171 | 32 | 203 | 2 | ---- | 2 |
| Net tonnage | 300 | 2,022 | 255 | 2,277 | 12 | ---- | 12 |
| Total vessels | 21 | 184 | 32 | 216 | 2 | ---- | 2 |
| Total net tonnage | 300 | 2,388 | 255 | 2,643 | 12 | ---- | 12 |
| Boats: | | | | | | | |
| Motor | 2 | 232 | 70 | 302 | 220 | 95 | 315 |
| Other | 1 | 370 | 81 | 451 | 208 | 27 | 235 |
| Apparatus: | | | | | | | |
| Haul seines | ---- | 57 | 2 | 59 | ---- | ---- | ---- |
| Length, yards | ---- | 26,868 | 500 | 27,368 | ---- | ---- | ---- |
| Gill nets: | | | | | | | |
| "Shoal," 2¼ to 3⅞ inches | 2,825 | 42,506 | 2,993 | 45,499 | 4,096 | ---- | 4,096 |
| Square yards | 565,000 | 8,509,400 | 769,300 | 9,278,700 | 1,515,300 | ---- | 1,515,300 |
| "Shoal," 4 to 6 inches | 1,675 | 20,183 | 3,195 | 23,378 | 2,109 | 266 | 2,375 |
| Square yards | 325,000 | 4,469,100 | 968,500 | 5,437,600 | 604,010 | 84,384 | 688,394 |
| Trammel nets | ---- | 6 | ---- | 6 | ---- | ---- | ---- |
| Square yards | ---- | 600 | ---- | 600 | ---- | ---- | ---- |
| Lines: | | | | | | | |
| Trot | ---- | 7,397 | 1,095 | 8,492 | 860 | ---- | 860 |
| Hooks | ---- | 2,248,050 | 278,800 | 2,526,850 | 41,675 | ---- | 41,675 |
| Pound nets | ---- | 345 | 96 | 441 | ---- | 69 | 69 |
| Fyke nets | ---- | 1,464 | 27 | 1,491 | ---- | 93 | 93 |
| Crawfish pots | ---- | 740 | ---- | 740 | ---- | ---- | ---- |
| Crowfoot bars | ---- | 15 | ---- | 15 | ---- | ---- | ---- |

### OPERATING UNITS OF LAKE ONTARIO: BY GEAR [1]

| Item | Haul seines | Gill nets | | | Trot lines | Trap nets | Fyke nets | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| | | "Shoal" 2¼ to 3⅞ inches | "Shoal" 4 to 6 inches | "Shoal" 10 to 14 inches | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | ---- | 11 | 4 | ---- | ---- | ---- | ---- | 11 |
| On boats and shore: | | | | | | | | |
| Regular | ---- | 30 | 16 | 6 | 3 | 16 | 5 | 36 |
| Casual | 19 | 19 | 9 | 7 | 50 | 28 | 14 | 120 |
| Total | 19 | 60 | 29 | 13 | 53 | 44 | 19 | 167 |
| Vessels, motor | ---- | 3 | 1 | ---- | ---- | ---- | ---- | 3 |
| Net tonnage | ---- | 33 | 7 | ---- | ---- | ---- | ---- | 33 |
| Boats: | | | | | | | | |
| Motor | 4 | 21 | 13 | 5 | 10 | 18 | 6 | 44 |
| Other | 5 | 9 | 3 | 6 | 39 | 9 | 10 | 72 |
| Apparatus: | | | | | | | | |
| Number | 7 | 1,337 | 483 | 34 | 83 | 140 | 145 | ---- |
| Length, yards | 583 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Square yards | ---- | 218,070 | 90,330 | 10,200 | ---- | ---- | ---- | ---- |
| Hooks | ---- | ---- | ---- | ---- | 16,600 | ---- | ---- | ---- |

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[1] Includes Niagara River below the Falls, and the St. Lawrence River.

*Lake fisheries of the United States, 1938*—Continued

OPERATING UNITS OF LAKE ERIE: BY GEAR[1]

| Item | Haul seines | Gill nets | | | Bar nets | Trot lines | Pound nets | Trap nets | Fyke nets | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|
| | | "Shoal" 2¼ to 3⅞ inches | "Shoal" 4 to 6 inches | "Shoal" 10 to 14 inches | | | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | | |
| On vessels | | 264 | 241 | | | | | | | 264 |
| On boats and shore: | | | | | | | | | | |
| Regular | 146 | 79 | 47 | 1 | 12 | 6 | 20 | 524 | 94 | 787 |
| Casual | 222 | 65 | 30 | 1 | 7 | 43 | 7 | 76 | 45 | 420 |
| Total | 368 | 408 | 318 | 2 | 19 | 49 | 27 | 600 | 139 | 1,471 |
| Vessels: | | | | | | | | | | |
| Steam | | 13 | 12 | | | | | | | 13 |
| Net tonnage | | 305 | 273 | | | | | | | 305 |
| Motor | | 39 | 35 | | | | | | | 39 |
| Net tonnage | | 433 | 363 | | | | | | | 433 |
| Total vessels | | 52 | 47 | | | | | | | 52 |
| Total net tonnage | | 738 | 636 | | | | | | | 738 |
| Boats: | | | | | | | | | | |
| Motor | 42 | 42 | 30 | 1 | 5 | 5 | 10 | 203 | 34 | 304 |
| Other | 157 | 12 | 3 | | 7 | 42 | | 146 | 68 | 383 |
| Apparatus: | | | | | | | | | | |
| Number | 173 | 21,740 | 11,286 | 8 | 110 | 116 | 45 | 6,105 | 794 | |
| Length, yards | 74,416 | | | | | | | | | |
| Square yards | | 3,435,000 | 2,246,850 | 2,400 | 16,500 | | | | | |
| Hooks | | | | | | 25,200 | | | | |

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[1] Includes Niagara River above the falls.

OPERATING UNITS OF LAKE HURON: BY GEAR

| Item | Haul seines | Gill nets | | Trot lines | Pound nets | Trap nets | Fyke nets | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| | | "Shoal" 2¼ to 3⅞ inches | "Shoal" 4 to 6 inches | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | 48 | 66 | 53 | 8 | 27 | | 121 |
| On boats and shore: | | | | | | | | |
| Regular | 90 | 99 | 126 | 28 | 200 | 523 | 47 | 699 |
| Casual | 48 | 35 | 36 | 8 | 16 | 42 | 9 | 134 |
| Total | 138 | 182 | 228 | 89 | 224 | 592 | 56 | 954 |
| Vessels: | | | | | | | | |
| Steam | | 3 | 4 | 2 | | | | 5 |
| Net tonnage | | 53 | 55 | 41 | | | | 81 |
| Motor | | 8 | 15 | 11 | 2 | 8 | | 28 |
| Net tonnage | | 146 | 231 | 232 | 18 | 89 | | 448 |
| Total vessels | | 11 | 19 | 13 | 2 | 8 | | 33 |
| Total net tonnage | | 199 | 286 | 273 | 18 | 89 | | 529 |
| Boats: | | | | | | | | |
| Motor | 34 | 50 | 53 | 10 | 78 | 180 | 18 | 260 |
| Other | 29 | 36 | 33 | 8 | 64 | 120 | 31 | 253 |
| Apparatus: | | | | | | | | |
| Number | 69 | 2,870 | 5,975 | 636 | 449 | 3,066 | 276 | |
| Length, yards | 33,605 | | | | | | | |
| Square yards | | 574,000 | 1,337,500 | | | | | |
| Hooks | | | | 189,900 | | | | |

## *Lake fisheries of the United States, 1938*—Continued

### OPERATING UNITS OF LAKE MICHIGAN: BY GEAR

| Item | Haul seines | Gill nets | | Trammel nets | Trot lines | Pound nets |
|---|---|---|---|---|---|---|
| | | "Shoal" 2¼ to 3⅞ inches | "Shoal" 4 to 6 inches | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | -------- | 842 | 724 | -------- | 176 | 78 |
| On boats and shore: | | | | | | |
| Regular | 61 | 560 | 395 | 4 | 74 | 326 |
| Casual | 105 | 507 | 313 | 5 | 33 | 136 |
| Total | 166 | 1,909 | 1,432 | 9 | 283 | 540 |
| essels: | | | | | | |
| Steam | -------- | 17 | 10 | -------- | 6 | 2 |
| Net tonnage | -------- | 349 | 227 | -------- | 167 | 28 |
| Motor | -------- | 246 | 206 | -------- | 46 | 26 |
| Net tonnage | -------- | 2,855 | 2,528 | -------- | 664 | 195 |
| Total vessels | -------- | 263 | 216 | -------- | 52 | 28 |
| Total net tonnage | -------- | 3,204 | 2,755 | -------- | 831 | 223 |
| Boats: | | | | | | |
| Motor | 26 | 254 | 168 | 2 | 30 | 137 |
| Other | 57 | 257 | 123 | 6 | 44 | 137 |
| Apparatus: | | | | | | |
| Number | 59 | 64,588 | 43,972 | 6 | 7,907 | 1,093 |
| Length, yards | 27,233 | -------- | -------- | -------- | -------- | -------- |
| Square yards | -------- | 12,859,300 | 9,584,000 | 600 | -------- | -------- |
| Hooks | -------- | -------- | -------- | -------- | 2,403,450 | -------- |

| Item | Fyke nets | Crawfish pots | Crowfoot bars | Picks | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 53 | -------- | -------- | -------- | -------- | 1,031 |
| On boats and shore: | | | | | | |
| Regular | 193 | -------- | -------- | -------- | -------- | 918 |
| Casual | 60 | 5 | 55 | 19 | 11 | 953 |
| Total | 306 | 5 | 55 | 19 | 11 | 2,902 |
| Vessels: | | | | | | |
| Steam | 1 | -------- | -------- | -------- | -------- | 22 |
| Net tonnage | 13 | -------- | -------- | -------- | -------- | 499 |
| Motor | 20 | -------- | -------- | -------- | -------- | 296 |
| Net tonnage | 161 | -------- | -------- | -------- | -------- | 3,499 |
| Total vessels | 21 | -------- | -------- | -------- | -------- | 318 |
| Total net tonnage | 174 | -------- | -------- | -------- | -------- | 3,998 |
| Boats: | | | | | | |
| Motor | 78 | 2 | 45 | 10 | -------- | 447 |
| Other | 109 | 5 | 17 | 6 | 11 | 545 |
| Apparatus, number | 1,564 | 740 | 62 | 19 | -------- | -------- |

## *Lake fisheries of the United States, 1938*—Continued

### OPERATING UNITS OF LAKE SUPERIOR: BY GEAR

| Item | Haul seines | Gill nets: "Shoal" 2¼ to 3⅞ inches | Gill nets: "Shoal" 4 to 6 inches | Lines: Troll | Lines: Trot | Pound nets | Fyke nets | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
|  | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: |  |  |  |  |  |  |  |  |
| On vessels |  | 107 | 120 |  | 110 | 21 | 8 | 189 |
| On boats and shore: |  |  |  |  |  |  |  |  |
| Regular | 26 | 685 | 437 | 18 | 308 | 97 | 2 | 853 |
| Casual | 20 | 224 | 182 | 14 | 78 | 28 | 6 | 318 |
| Total | 46 | 1,016 | 739 | 32 | 496 | 146 | 16 | 1,360 |
| Vessels: |  |  |  |  |  |  |  |  |
| Steam |  | 1 | 4 |  | 3 | 1 |  | 4 |
| Net tonnage |  | 24 | 134 |  | 108 | 24 |  | 134 |
| Motor |  | 37 | 34 |  | 28 | 7 | 4 | 59 |
| Net tonnage |  | 334 | 331 |  | 306 | 59 | 22 | 590 |
| Total vessels |  | 38 | 38 |  | 31 | 8 | 4 | 63 |
| Total net tonnage |  | 358 | 465 |  | 414 | 83 | 22 | 724 |
| Boats: |  |  |  |  |  |  |  |  |
| Motor | 10 | 396 | 291 | 10 | 189 | 44 | 2 | 512 |
| Other | 10 | 312 | 155 |  | 58 | 33 | 3 | 379 |
| Apparatus: |  |  |  |  |  |  |  |  |
| Number | 17 | 11,939 | 12,669 | 75 | 5,202 | 232 | 33 |  |
| Length, yards | 3,404 |  |  |  |  |  |  |  |
| Square yards |  | 3,147,600 | 3,702,010 |  |  |  |  |  |
| Hooks |  |  |  | 525 | 1,049,575 |  |  |  |

### OPERATING UNITS OF LAKE OF THE WOODS, RAINY LAKE, AND NAMAKAN LAKE: BY GEAR

| Item | Gill nets, "shoal," 4 to 6 inches | Pound nets | Fyke nets | Total, exclusive of duplication |
|---|---|---|---|---|
|  | *Number* | *Number* | *Number* | *Number* |
| Fishermen, on boats and shore: |  |  |  |  |
| Regular | 90 | 34 | 29 | 120 |
| Casual | 2 |  |  | 2 |
| Total | 92 | 34 | 29 | 122 |
| Boats: |  |  |  |  |
| Motor | 74 | 21 | 23 | 95 |
| Other | 14 | 7 | 11 | 27 |
| Apparatus: |  |  |  |  |
| Number | 266 | 69 | 93 |  |
| Square yards | 84,384 |  |  |  |

### CATCH: BY GEAR

| Species | New York: Haul seines: Pounds | Haul seines: Value | Gill nets: Pounds | Gill nets: Value | Trot lines: Pounds | Trot lines: Value | Trap nets: Pounds | Trap nets: Value |
|---|---|---|---|---|---|---|---|---|
| Blue pike |  |  | 1,117,300 | $78,211 |  |  | 4,900 | $343 |
| Bowfin |  |  | 100 | 2 |  |  | 1,600 | 32 |
| Burbot |  |  | 13,000 | 130 |  |  | 6,100 | 61 |
| Carp | 158,200 | $9,492 | 1,400 | 84 |  |  | 12,200 | 732 |
| Catfish and bullheads | 700 | 49 | 700 | 49 | 200 | $14 | 35,700 | 2,499 |
| Cisco |  |  | 427,700 | 51,324 |  |  | 3,700 | 444 |
| Eels, common |  |  |  |  |  |  | 39,800 | 2,388 |
| Garfish | 5,900 | 59 |  |  |  |  |  |  |
| Lake herring |  |  | 6,200 | 620 |  |  |  |  |
| Lake trout | 8,500 | 1,760 | 6,300 | 1,260 |  |  | 2,100 | 420 |
| Pike or pickerel (jacks) |  |  | 300 | 30 |  |  | 8,200 | 820 |
| Rock bass |  |  |  |  |  |  | 4,400 | 264 |
| Sauger |  |  | 200 | 14 |  |  |  |  |
| Sheepshead |  |  |  |  |  |  | 100 | 2 |
| Sturgeon | 500 | 175 | 3,300 | 1,155 | 14,500 | 5,075 | 500 | 175 |
| Sucker "mullet" | 17,100 | 513 | 105,200 | 3,156 | 600 | 18 | 22,600 | 678 |
| Sunfish |  |  |  |  |  |  | 40,200 | 2,412 |
| White bass |  |  | 600 | 36 |  |  | 5,000 | 300 |
| Whitefish, common |  |  | 112,900 | 27,135 |  |  | 34,000 | 6,800 |
| Yellow perch | 200 | 14 | 86,100 | 6,027 | 100 | 7 | 16,800 | 1,176 |
| Yellow pike |  |  | 2,900 | 290 |  |  | 5,400 | 540 |
| Total | 191,100 | 12,062 | 1,884,200 | 169,523 | 15,400 | 5,114 | 243,300 | 20,086 |

### *Lake fisheries of the United States, 1938*—Continued

CATCH: BY GEAR—Continued

| Species | New York—Continued | | | | Pennsylvania | |
|---|---|---|---|---|---|---|
| | Fyke nets | | Total | | Gill nets | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Blue pike | | | 1,122,200 | $78,554 | 1,260,800 | $88,256 |
| Bowfin | | | 1,700 | 34 | | |
| Burbot | | | 19,100 | 191 | 18,800 | 188 |
| Carp | 1,300 | $78 | 173,100 | 10,386 | | |
| Catfish and bullheads | 15,500 | 1,085 | 52,800 | 3,696 | | |
| Cisco | 1,300 | 156 | 432,700 | 51,924 | 370,100 | 44,412 |
| Eels, common | 4,500 | 270 | 44,300 | 2,658 | | |
| Garfish | | | 5,900 | 59 | | |
| Lake herring | | | 6,200 | 620 | | |
| Lake trout | | | 16,900 | 3,440 | 100 | 20 |
| Pike or pickerel (jacks) | 2,400 | 240 | 10,900 | 1,090 | | |
| Rock bass | | | 4,400 | 264 | | |
| Sauger | | | 200 | 14 | | |
| Sheepshead | | | 100 | 2 | 4,600 | 92 |
| Sturgeon | | | 18,800 | 6,580 | | |
| Sucker "mullet" | 8,400 | 252 | 153,900 | 4,617 | 6,600 | 132 |
| Sunfish | 3,900 | 234 | 44,100 | 2,646 | | |
| White bass | | | 5,600 | 336 | 7,500 | 300 |
| Whitefish, common | | | 146,900 | 33,935 | 466,300 | 93,260 |
| Yellow perch | 4,800 | 336 | 108,000 | 7,560 | 126,700 | 7,602 |
| Yellow pike | | | 8,300 | 830 | 100 | 10 |
| Total | 42,100 | 2,651 | 2,376,100 | 209,436 | 2,261,600 | 234,272 |

| Species | Pennsylvania—Continued | | | | Ohio | | | |
|---|---|---|---|---|---|---|---|---|
| | Pound nets | | Total | | Haul seines | | Gill nets | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Blue pike | 181,100 | $12,677 | 1,441,900 | $100,933 | 200 | $12 | 919,700 | $55,182 |
| Burbot | 9,300 | 93 | 28,100 | 281 | | | 14,100 | 282 |
| Carp | 4,000 | 80 | 4,000 | 80 | 1,094,100 | 32,823 | 7,500 | 225 |
| Catfish and bullheads | 1,800 | 108 | 1,800 | 108 | 154,700 | 12,376 | 300 | 24 |
| Cisco | 1,800 | 216 | 371,900 | 44,628 | | | 39,700 | 5,955 |
| Goldfish | | | | | 199,500 | 7,980 | | |
| Lake trout | | | 100 | 20 | | | | |
| Mooneye | | | | | 6,000 | 240 | | |
| Sauger | | | | | 21,300 | 2,130 | 204,300 | 20,430 |
| Sheepshead | 15,700 | 314 | 20,300 | 406 | 675,600 | 20,268 | 9,200 | 276 |
| Sturgeon | 300 | 81 | 300 | 81 | | | 8,800 | 2,640 |
| Sucker "mullet" | 8,600 | 172 | 15,200 | 304 | 23,500 | 940 | 12,300 | 492 |
| White bass | 28,100 | 1,124 | 35,600 | 1,424 | 98,600 | 5,916 | 16,400 | 984 |
| Whitefish, common | 59,900 | 11,980 | 526,200 | 105,240 | | | 84,300 | 16,860 |
| Yellow perch | 73,200 | 4,392 | 199,900 | 11,994 | 2,100 | 168 | 1,085,400 | 86,832 |
| Yellow pike | 28,100 | 2,810 | 28,200 | 2,820 | 18,800 | 1,880 | 24,100 | 2,410 |
| Total | 411,900 | 34,047 | 2,673,500 | 268,319 | 2,294,400 | 84,733 | 2,426,100 | 192,592 |

| Species | Ohio—Continued | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Bar nets | | Trap nets | | Fyke nets | | Total | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Blue pike | 200 | $12 | 5,215,900 | $358,482 | 17,800 | $1,068 | 6,153,800 | $414,756 |
| Burbot | | | 219,400 | 4,388 | 600 | 12 | 231,100 | 4,682 |
| Carp | 161,200 | 4,836 | 149,500 | 4,485 | 45,200 | 1,356 | 1,457,500 | 43,725 |
| Catfish and bullheads | 400 | 32 | 226,000 | 18,080 | 28,000 | 2,270 | 409,400 | 32,782 |
| Cisco | | | 1,500 | 225 | | | 41,200 | 6,180 |
| Goldfish | 2,100 | 84 | 5,000 | 200 | 4,100 | 164 | 210,700 | 8,428 |
| Mooneye | | | 5,300 | 212 | | | 11,300 | 452 |
| Sauger | | | 564,800 | 56,480 | 11,700 | 1,170 | 802,100 | 80,210 |
| Sheepshead | 1,800 | 54 | 2,421,400 | 72,642 | 130,900 | 3,927 | 3,238,900 | 97,167 |
| Sturgeon | | | 2,900 | 870 | | | 11,700 | 3,510 |
| Sucker "mullet" | 100 | 4 | 607,400 | 24,296 | 30,400 | 1,216 | 673,700 | 26,948 |
| White bass | | | 443,000 | 26,580 | 110,400 | 6,624 | 668,400 | 40,104 |
| Whitefish, common | | | 207,100 | 41,420 | 500 | 100 | 291,900 | 58,380 |
| Yellow perch | 100 | 8 | 3,814,400 | 305,152 | 10,000 | 800 | 4,912,000 | 392,960 |
| Yellow pike | 200 | 20 | 2,786,900 | 278,690 | 93,400 | 9,340 | 2,923,400 | 292,340 |
| Total | 166,100 | 5,050 | 16,670,500 | 1,192,202 | 483,000 | 28,047 | 22,040,100 | 1,502,624 |

## *Lake fisheries of the United States, 1938*—Continued

### CATCH: BY GEAR—Continued

| Species | Michigan | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Haul seines | | Gill nets | | Lines | | | |
| | | | | | Troll | | Trot | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | 700 | $14 | -------- | -------- | -------- | -------- | 100 | $2 |
| Burbot | -------- | -------- | 6, 400 | $64 | -------- | -------- | 14, 600 | 146 |
| Carp | 835, 800 | 25, 074 | 19, 100 | 673 | -------- | -------- | 1, 700 | 51 |
| Catfish and bullheads | 46, 700 | 3, 269 | -------- | -------- | -------- | -------- | 12, 600 | 702 |
| Chubs | -------- | -------- | 1, 678, 500 | 201, 420 | -------- | -------- | -------- | -------- |
| Goldfish | 3, 600 | 144 | -------- | -------- | -------- | -------- | -------- | -------- |
| Lake herring | 63, 200 | 1, 896 | 3, 859, 600 | 117, 434 | -------- | -------- | -------- | -------- |
| Lake trout | -------- | -------- | 4, 055, 300 | 608, 295 | 46, 400 | $6, 960 | 1, 542, 400 | 231, 160 |
| Pike or pickerel (jacks) | 2, 100 | 210 | 2, 600 | 260 | -------- | -------- | -------- | -------- |
| Rock bass | 5, 800 | 348 | 400 | 24 | -------- | -------- | -------- | -------- |
| Sauger | 100 | 10 | 700 | 70 | -------- | -------- | -------- | -------- |
| Sheepshead | 18, 300 | 366 | 100 | 2 | -------- | -------- | 3, 300 | 66 |
| Smelt | -------- | -------- | 267, 400 | 8, 022 | -------- | -------- | -------- | -------- |
| Sucker "mullet" | 87, 500 | 2, 625 | 351, 800 | 10, 554 | -------- | -------- | -------- | -------- |
| White bass | 600 | 36 | -------- | -------- | -------- | -------- | -------- | -------- |
| Whitefish: | | | | | | | | |
| Common | -------- | -------- | 898, 200 | 179, 640 | -------- | -------- | -------- | -------- |
| Menominee | -------- | -------- | 91, 200 | 9, 120 | -------- | -------- | -------- | -------- |
| Yellow perch | 16, 800 | 1, 344 | 643, 200 | 51, 456 | -------- | -------- | 2, 300 | 184 |
| Yellow pike | 106, 400 | 10, 640 | 56, 600 | 5, 660 | -------- | -------- | 400 | 40 |
| Total | 1, 187, 600 | 45, 976 | 11, 931, 100 | 1, 192, 694 | 46, 400 | 6, 960 | 1, 577, 400 | 232, 351 |

| Species | Michigan—Continued | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Pound nets | | Trap nets | | Fyke nets | | Crowfoot bars | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | -------- | -------- | 700 | $14 | 2, 400 | $48 | -------- | -------- |
| Burbot | 800 | $8 | 200 | 2 | 600 | 6 | -------- | -------- |
| Carp | 37, 200 | 816 | 173, 200 | 5, 196 | 314, 500 | 9, 435 | -------- | -------- |
| Catfish and bullheads | 2, 500 | 175 | 103, 600 | 7, 252 | 54, 700 | 3, 836 | -------- | -------- |
| Goldfish | -------- | -------- | -------- | -------- | 400 | 16 | -------- | -------- |
| Lake herring | 4, 179, 700 | 125, 391 | 2, 055, 000 | 61, 650 | 2, 500 | 75 | -------- | -------- |
| Lake trout | 143, 900 | 21, 585 | 144, 500 | 21, 675 | 1, 400 | 210 | -------- | -------- |
| Pike or pickerel (jacks) | 8, 400 | 840 | 20, 000 | 2, 000 | 15, 300 | 1, 530 | -------- | -------- |
| Rock bass | 1, 700 | 102 | 11, 500 | 690 | 14, 500 | 870 | -------- | -------- |
| Sauger | -------- | -------- | 3, 600 | 360 | 40, 200 | 4, 020 | -------- | -------- |
| Sheepshead | 7, 100 | 142 | 24, 700 | 494 | 103, 700 | 2, 074 | -------- | -------- |
| Smelt | 405, 900 | 12, 177 | -------- | -------- | -------- | -------- | -------- | -------- |
| Sucker "mullet" | 1, 095, 300 | 32, 859 | 1, 557, 200 | 46, 726 | 251, 000 | 7, 530 | -------- | -------- |
| White bass | -------- | -------- | -------- | -------- | 22, 100 | 1, 326 | -------- | -------- |
| Whitefish: | | | | | | | | |
| Common | 656, 500 | 131, 300 | 443, 500 | 88, 700 | 5, 500 | 1, 100 | -------- | -------- |
| Menominee | 6, 500 | 650 | 17, 200 | 1, 720 | -------- | -------- | -------- | -------- |
| Yellow perch | 79, 100 | 6, 328 | 371, 200 | 29, 696 | 123, 700 | 9, 896 | -------- | -------- |
| Yellow pike | 73, 600 | 7, 360 | 1, 178, 300 | 117, 830 | 172, 300 | 17, 230 | -------- | -------- |
| Mussel shells [1] | -------- | -------- | -------- | -------- | -------- | -------- | 125, 000 | $3, 150 |
| Pearls and slugs [1] | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 50 |
| Total | 6, 698, 200 | 339, 733 | 6, 104, 400 | 384, 005 | 1, 124, 800 | 59, 202 | 125, 000 | 3, 200 |

[1] From tributary streams.

## *Lake fisheries of the United States, 1938*—Continued

CATCH: BY GEAR—Continued

| Species | Michigan—Continued | | | | | | Indiana | |
|---|---|---|---|---|---|---|---|---|
| | Picks | | By hand | | Total | | Haul seines | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | | | | | 3,900 | $78 | | |
| Burbot | | | | | 22,600 | 226 | | |
| Carp | | | | | 1,381,500 | 41,245 | 4,000 | $160 |
| Catfish and bullheads | | | | | 220,100 | 15,234 | | |
| Chubs | | | | | 1,678,500 | 201,420 | | |
| Goldfish | | | | | 4,000 | 160 | | |
| Lake herring | | | | | 10,160,000 | 306,446 | | |
| Lake trout | | | | | 5,933,900 | 889,885 | | |
| Pike or pickerel (jacks) | | | | | 48,400 | 4,840 | | |
| Rock bass | | | | | 33,900 | 2,034 | | |
| Sauger | | | | | 44,600 | 4,460 | | |
| Sheepshead | | | | | 157,200 | 3,144 | | |
| Smelt | | | | | 673,300 | 20,199 | | |
| Sucker "mullet" | | | | | 3,342,800 | 100,294 | | |
| White bass | | | | | 22,700 | 1,362 | | |
| Whitefish: | | | | | | | | |
| Common | | | | | 2,003,700 | 400,740 | | |
| Menominee | | | | | 114,900 | 11,490 | | |
| Yellow perch | | | | | 1,236,300 | 98,904 | | |
| Yellow pike | | | | | 1,587,600 | 158,760 | | |
| Mussel shells [1] | 30,000 | $750 | 13,500 | $278 | 168,500 | 4,178 | | |
| Pearls and slugs [1] | | 20 | | 9 | | 79 | | |
| Total | 30,000 | 770 | 13,500 | 287 | 28,838,400 | 2,265,178 | 4,000 | 160 |

| Species | Indiana—Continued | | | | | | Illinois | |
|---|---|---|---|---|---|---|---|---|
| | Gill nets | | Pound nets | | Total | | Gill nets | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Burbot | 1,200 | $24 | | | 1,200 | $24 | 5,000 | $100 |
| Carp | | | | | 4,000 | 160 | | |
| Chubs | 277,000 | 22,157 | | | 277,000 | 22,157 | 524,900 | 78,730 |
| Lake herring | 219,100 | 10,956 | 8,500 | $425 | 227,600 | 11,381 | 145,800 | 7,289 |
| Lake trout | 174,200 | 27,834 | | | 174,200 | 27,834 | 311,400 | 62,277 |
| Steelhead trout | 1,200 | 240 | | | 1,200 | 240 | | |
| Sucker "mullet" | 1,500 | 45 | 3,500 | 105 | 5,000 | 150 | | |
| Yellow perch | 73,000 | 3,650 | | | 73,000 | 3,650 | 168,400 | 8,420 |
| Total | 747,200 | 64,906 | 12,000 | 530 | 763,200 | 65,596 | 1,155,500 | 156,816 |

| Species | Wisconsin | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Haul seines | | Gill nets | | Trammel nets | | Trot lines | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Burbot | 4,200 | $42 | 9,900 | $99 | | | 3,800 | $38 |
| Carp | 1,644,500 | 69,155 | 76,200 | 2,286 | 1,000 | $30 | 100 | 3 |
| Catfish and bullheads | | | 3,600 | 252 | | | 100 | 7 |
| Chubs | | | 3,234,400 | 385,226 | | | | |
| Lake herring | | | 3,541,200 | 153,276 | | | | |
| Lake trout | | | 1,562,400 | 295,060 | | | 566,800 | 108,935 |
| Pike or pickerel (jacks) | | | 1,700 | 170 | | | 100 | 10 |
| Sheepshead | | | 100 | 2 | | | | |
| Smelt | 4,700 | 141 | 1,041,900 | 31,257 | | | | |
| Sucker "mullet" | 30,500 | 905 | 349,500 | 10,395 | | | 300 | 9 |
| White bass | | | 200 | 12 | | | | |
| Whitefish: | | | | | | | | |
| Common | 200 | 40 | 91,900 | 17,412 | | | 100 | 22 |
| Menominee | | | 28,200 | 2,820 | | | | |
| Yellow perch | 123,600 | 7,353 | 386,800 | 23,208 | | | 800 | 48 |
| Yellow pike | | | 8,900 | 890 | | | 100 | 10 |
| Total | 1,807,700 | 77,636 | 10,336,900 | 922,365 | 1,000 | 30 | 572,200 | 109,082 |

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[1] From tributary streams.

*Lake fisheries of the United States, 1938*—Continued

CATCH: BY GEAR—Continued

| Species | Wisconsin—Continued | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Pound nets | | Fyke nets | | Crawfish pots | | Crowfoot bars | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Burbot | 4,800 | $48 | 3,600 | $36 | | | | |
| Carp | 400 | 12 | 106,300 | 3,189 | | | | |
| Catfish and bullheads | | | 61,500 | 4,305 | | | | |
| Chubs | 60,500 | 7,248 | 13,400 | 1,608 | | | | |
| Lake herring | 696,100 | 37,468 | 14,100 | 705 | | | | |
| Lake trout | 330,100 | 62,040 | 1,000 | 185 | | | | |
| Pike or pickerel (jacks) | 400 | 40 | 1,200 | 110 | | | | |
| Sheepshead | | | 100 | 2 | | | | |
| Smelt | 88,500 | 2,655 | 37,400 | 1,122 | | | | |
| Sucker "mullet" | 77,400 | 2,322 | 161,900 | 4,857 | | | | |
| White bass | | | 3,200 | 192 | | | | |
| Whitefish: | | | | | | | | |
| Common | 171,500 | 36,104 | 800 | 176 | | | | |
| Menominee | 6,700 | 670 | | | | | | |
| Yellow perch | 21,800 | 1,308 | 726,600 | 43,536 | | | | |
| Yellow pike | 30,000 | 3,000 | 1,400 | 140 | | | | |
| Crawfish | | | | | 6,000 | $450 | | |
| Mussel shells [1] | | | | | | | 100,400 | $1,400 |
| Total | 1,488,200 | 152,915 | 1,132,500 | 60,163 | 6,000 | 450 | 100,400 | 1,400 |

| Species | Wisconsin—Continued | | | | Minnesota | | | |
|---|---|---|---|---|---|---|---|---|
| | By hand | | Total | | Gill nets | | Trot lines | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Burbot | | | 26,300 | $263 | 7,300 | $73 | | |
| Carp | | | 1,828,500 | 74,675 | 400 | 8 | | |
| Catfish and bullheads | | | 65,200 | 4,564 | 3,300 | 165 | | |
| Chubs | | | 3,308,300 | 394,082 | 63,800 | 6,380 | | |
| Lake herring | | | 4,251,400 | 191,449 | 5,729,000 | 117,460 | | |
| Lake trout | | | 2,460,300 | 466,220 | 342,000 | 35,889 | 120,800 | $11,306 |
| Pike or pickerel (jacks) | | | 3,400 | 330 | 82,200 | 6,640 | | |
| Sauger | | | | | 68,600 | 5,134 | | |
| Sheepshead | | | 200 | 4 | | | | |
| Smelt | | | 1,172,500 | 35,175 | | | | |
| Sucker "mullet" | | | 619,600 | 18,488 | 86,200 | 1,792 | | |
| Tullibees | | | | | 841,400 | 42,070 | | |
| White bass | | | 3,400 | 204 | | | | |
| Whitefish: | | | | | | | | |
| Common | | | 264,500 | 53,754 | 53,800 | 5,532 | | |
| Menominee | | | 34,900 | 3,490 | 3,600 | 190 | | |
| Yellow perch | | | 1,259,600 | 75,453 | 46,200 | 2,312 | | |
| Yellow pike | | | 40,400 | 4,040 | 203,300 | 19,465 | | |
| Crawfish | | | 6,000 | 450 | | | | |
| Mussel shells [1] | 30,100 | $425 | 130,500 | 1,825 | | | | |
| Total | 30,100 | 425 | 15,475,000 | 1,324,466 | 7,531,100 | 243,110 | 120,800 | 11,306 |

| Species | Minnesota—Continued | | | | | |
|---|---|---|---|---|---|---|
| | Pound nets | | Fyke nets | | Total | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Burbot | 4,900 | $50 | 9,300 | $100 | 21,500 | $223 |
| Carp | 9,200 | 185 | 1,400 | 28 | 11,000 | 221 |
| Catfish and bullheads | 13,300 | 667 | 24,700 | 1,232 | 41,300 | 2,064 |
| Chubs | | | | | 63,800 | 6,380 |
| Crappie | 100 | 4 | 300 | 12 | 400 | 16 |
| Lake herring | 2,900 | 50 | | | 5,731,900 | 117,510 |
| Lake trout | | | | | 462,800 | 47,195 |
| Pike or pickerel (jacks) | 61,900 | 4,948 | 24,300 | 1,143 | 168,400 | 12,731 |
| Sauger | 13,800 | 827 | 5,500 | 329 | 87,900 | 6,290 |
| Sturgeon | 100 | 25 | | | 100 | 25 |
| Sucker "mullet" | 79,400 | 1,587 | 26,100 | 521 | 191,700 | 3,900 |
| Tullibees | 26,900 | 1,342 | 10,100 | 503 | 878,400 | 43,915 |
| Whitefish: | | | | | | |
| Common | 15,100 | 1,500 | 400 | 37 | 69,300 | 7,069 |
| Menominee | | | | | 3,600 | 190 |
| Yellow perch | 7,500 | 375 | 5,900 | 297 | 59,600 | 2,984 |
| Yellow pike | 171,100 | 16,941 | 36,600 | 3,658 | 411,000 | 40,064 |
| Total | 406,200 | 28,501 | 144,600 | 7,860 | 8,202,700 | 290,777 |

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[1] From tributary streams.

## *Lake fisheries of the United States, 1938*—Continued

CATCH: BY LAKES

| Species | Lake Ontario | | Lake Erie | | | |
|---|---|---|---|---|---|---|
| | New York | | New York | | Pennsylvania | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Blue pike | 58, 500 | $4, 095 | 1, 063, 700 | $74, 459 | 1. 441, 900 | $100, 933 |
| Bowfin | 1, 700 | 34 | ---------- | ---------- | ---------- | ---------- |
| Burbot | 19, 000 | 190 | 100 | 1 | 28, 100 | 281 |
| Carp | 134, 700 | 8, 082 | 38, 400 | 2, 304 | 4, 000 | 80 |
| Catfish and bullheads | 52, 200 | 3, 654 | 600 | 42 | 1, 800 | 108 |
| Cisco | 36, 100 | 4, 332 | 396, 600 | 47, 592 | 371, 900 | 44, 628 |
| Eels, common | 44, 300 | 2, 658 | ---------- | ---------- | ---------- | ---------- |
| Garfish | ---------- | ---------- | 5, 900 | 59 | ---------- | ---------- |
| Lake herring | 6, 200 | 620 | ---------- | ---------- | ---------- | ---------- |
| Lake trout | 16, 900 | 3, 440 | ---------- | ---------- | 100 | 20 |
| Pike or pickerel (jacks) | 10, 900 | 1, 090 | ---------- | ---------- | ---------- | ---------- |
| Rock bass | 4, 400 | 264 | ---------- | ---------- | ---------- | ---------- |
| Sauger | ---------- | ---------- | 200 | 14 | ---------- | ---------- |
| Sheepshead | ---------- | ---------- | 100 | 2 | 20, 300 | 406 |
| Sturgeon | 10, 500 | 3, 675 | 8, 300 | 2, 905 | 300 | 81 |
| Sucker, "mullet" | 128, 600 | 3, 858 | 25, 300 | 759 | 15, 200 | 304 |
| Sunfish | 44, 100 | 2, 646 | ---------- | ---------- | ---------- | ---------- |
| White bass | 5, 000 | 300 | 600 | 36 | 35, 600 | 1, 424 |
| Whitefish, common | 55, 800 | 11, 160 | 91, 100 | 22, 775 | 526, 200 | 105, 240 |
| Yellow perch | 58, 400 | 4, 088 | 49, 600 | 3, 472 | 199, 900 | 11, 994 |
| Yellow pike | 2, 200 | 220 | 6, 100 | 610 | 28, 200 | 2, 820 |
| Total | 689, 500 | 54, 406 | 1, 686, 600 | 155, 030 | 2, 673, 500 | 268, 319 |

| Species | Lake Erie—Continued | | | | | |
|---|---|---|---|---|---|---|
| | Ohio | | Michigan | | **Total** | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Blue pike | 6, 153, 800 | $414, 756 | ---------- | ---------- | 8, 659, 400 | $590, 148 |
| Bowfin | ---------- | ---------- | 2, 800 | $56 | 2, 800 | 56 |
| Burbot | 234, 100 | 4, 682 | 300 | 3 | 262, 600 | 4. 967 |
| Carp | 1, 457, 500 | 43, 725 | 709, 600 | 21, 288 | 2, 209. 500 | 67, 397 |
| Catfish and bullheads | 409, 400 | 32, 782 | 52, 000 | 3, 640 | 463, 800 | 36, 572 |
| Cisco | 41, 200 | 6, 180 | ---------- | ---------- | 809, 700 | 98, 400 |
| Garfish | ---------- | ---------- | ---------- | ---------- | 5, 900 | 59 |
| Goldfish | 210, 700 | 8, 428 | 4, 000 | 160 | 214, 700 | 8, 588 |
| Lake trout | ---------- | ---------- | ---------- | ---------- | 100 | 20 |
| Mooneye | 11, 300 | 452 | ---------- | ---------- | 11, 300 | 452 |
| Pike or pickerel (jacks) | ---------- | ---------- | 3, 200 | 320 | 3, 200 | 320 |
| Rock bass | ---------- | ---------- | 3, 400 | 204 | 3, 400 | 204 |
| Sauger | 802, 100 | 80, 210 | 42, 100 | 4, 210 | 844, 400 | 84, 434 |
| Sheepshead | 3, 238, 900 | 97, 167 | 133, 000 | 2, 660 | 3, 392, 300 | 100, 235 |
| Sturgeon | 11, 700 | 3, 510 | ---------- | ---------- | 20, 300 | 6, 496 |
| Sucker, "mullet" | 673, 700 | 26, 948 | 41, 800 | 1, 264 | 756, 000 | 29, 275 |
| White bass | 668, 400 | 40, 104 | 22, 700 | 1, 362 | 727, 300 | 42, 926 |
| Whitefish, common | 291, 900 | 58, 380 | 1, 700 | 340 | 910, 900 | 186, 735 |
| Yellow perch | 4, 912, 000 | 392, 960 | 25, 400 | 2, 032 | 5, 186, 900 | 410, 458 |
| Yellow pike | 2, 923, 400 | 292, 340 | 176, 900 | 17, 690 | 3, 134, 600 | 313, 460 |
| Total | 22, 040, 100 | 1, 502, 624 | 1, 218, 900 | 55, 229 | 27, 619, 100 | 1, 981, 202 |

## *Lake fisheries of the United States, 1938*—Continued

CATCH: BY LAKES—Continued

| Species | Lake Huron | | Lake Michigan | | | |
|---|---|---|---|---|---|---|
| | Michigan | | Michigan | | Indiana | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | 1,100 | $22 | | | | |
| Burbot | 12,000 | 120 | 7,000 | $70 | 1,200 | $24 |
| Carp | 631,100 | 19,033 | 40,500 | 915 | 4,000 | 160 |
| Catfish and bullheads | 165.700 | 11,419 | 2,400 | 175 | | |
| Chubs | 192,100 | 23,052 | 1,439,100 | 172,692 | 277,000 | 22,157 |
| Lake herring | 5,428,800 | 164,450 | 2.337,400 | 70,182 | 227,600 | 11,381 |
| Lake trout | 1,270,100 | 190,515 | 2,479,800 | 371,970 | 174,200 | 27,834 |
| Pike or pickerel (jacks) | 25,500 | 2,550 | 18,200 | 1,820 | | |
| Rock bass | 27,900 | 1,674 | 2,600 | 156 | | |
| Sauger | 2,100 | 210 | 400 | 40 | | |
| Sheepshead | 19,800 | 396 | 4,400 | 88 | | |
| Smelt | 100 | 3 | 668,900 | 20,067 | | |
| Steelhead trout | | | | | 1,200 | 240 |
| Sucker "mullet" | 1,788 200 | 53,646 | 1,300,800 | 39,024 | 5,000 | 150 |
| Whitefish: | | | | | | |
| Common | 558,000 | 111,600 | 1,117,100 | 223,420 | | |
| Menominee | 54,200 | 5,420 | 53,800 | 5,380 | | |
| Yellow perch | 500,400 | 40,032 | 704,100 | 56,328 | 73,000 | 3,650 |
| Yellow pike | 1,356,100 | 135,610 | 49,600 | 4,960 | | |
| Mussel shells[1] | 5,500 | 78 | 163,000 | 4,100 | | |
| Pearls and slugs[1] | | | | 79 | | |
| Total | 12.038,700 | 759,830 | 10,389,100 | 971,466 | 763,200 | 65,596 |

| Species | Lake Michigan—Continued | | | | | |
|---|---|---|---|---|---|---|
| | Illinois | | Wisconsin | | Total | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Burbot | 5,000 | $100 | 21,100 | $211 | 34,300 | $405 |
| Carp | | | 1,828,500 | 74.675 | 1,873,000 | 75,750 |
| Catfish and bullheads | | | 65,200 | 4,564 | 67,600 | 4,739 |
| Chubs | 524,900 | 78,730 | 3,163,100 | 379,562 | 5,404,100 | 653,141 |
| Lake herring | 145,800 | 7,289 | 1,766,500 | 92,109 | 4,477,300 | 180,961 |
| Lake trout | 311,400 | 62,277 | 1,940,200 | 388,100 | 4,905.600 | 850.181 |
| Pike or pickerel (jacks) | | | 200 | 20 | 18,400 | 1,840 |
| Rock bass | | | | | 2,600 | 156 |
| Sauger | | | | | 400 | 40 |
| Sheepshead | | | 200 | 4 | 4,600 | 92 |
| Smelt | | | 1,172,500 | 35,175 | 1,841,400 | 55,242 |
| Steelhead trout | | | | | 1,200 | 240 |
| Sucker "mullet" | | | 552,300 | 16,459 | 1,858,100 | 55,633 |
| White bass | | | 3,400 | 204 | 3,400 | 204 |
| Whitefish: | | | | | | |
| Common | | | 141,800 | 29,196 | 1,258,900 | 252,616 |
| Menominee | | | 21,900 | 2,190 | 75,700 | 7,570 |
| Yellow perch | 168,400 | 8,420 | 1,258,100 | 75,363 | 2,203,600 | 143,761 |
| Yellow pike | | | | | 49,600 | 4,960 |
| Crawfish | | | 6,000 | 450 | 6,000 | 450 |
| Mussel shells[1] | | | 130,500 | 1,825 | 293,500 | 5,925 |
| Pearls and slugs[1] | | | | | | 79 |
| Total | 1,155,500 | 156.816 | 12,071,500 | 1,100,107 | 24,379,300 | 2,293,985 |

| Species | Lake Superior | | | | | |
|---|---|---|---|---|---|---|
| | Michigan | | Wisconsin | | Minnesota | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Burbot | 3,300 | $33 | 5,200 | $52 | | |
| Carp | 300 | 9 | | | | |
| Chubs | 47,300 | 5,676 | 145,200 | 14,520 | 63,800 | $6,380 |
| Lake herring | 2,393,800 | 71,814 | 2,484,900 | 99,340 | 5,715,000 | 117,180 |
| Lake trout | 2,184,000 | 327,400 | 520,100 | 78,120 | 462,800 | 47,195 |
| Pike or pickerel (jacks) | 1,500 | 150 | 3,200 | 310 | 400 | 44 |
| Smelt | 4,300 | 129 | | | | |
| Sucker "mullet" | 212.000 | 6,360 | 67,300 | 2.029 | 9,400 | 258 |
| Whitefish: | | | | | | |
| Common | 326,900 | 65,380 | 122,700 | 24,558 | 5,800 | 754 |
| Menominee | 6,900 | 690 | 13,000 | 1,300 | 3,600 | 190 |
| Yellow perch | 6,400 | 512 | 1,500 | 90 | | |
| Yellow pike | 5,000 | 500 | 40,400 | 4,040 | | |
| Total | 5,191,700 | 478,653 | 3,403.500 | 224,359 | 6,260,800 | 172,001 |

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[1] From tributary streams.

## *Lake fisheries of the United States, 1938*—Continued

### CATCH: BY LAKES—Continued

| Species | Lake Superior—Continued | | Lake of the Woods, Rainy Lake, and Namakan Lake | | Total, all lakes | |
|---|---|---|---|---|---|---|
| | Total | | Minnesota | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Blue pike | -------- | -------- | -------- | -------- | 8,717,900 | $591,243 |
| Bowfin | -------- | -------- | -------- | -------- | 5,600 | 112 |
| Burbot | 8,500 | $85 | 21,500 | $223 | 357,900 | 5,990 |
| Carp | 300 | 9 | 11,000 | 221 | 4,859,600 | 170,492 |
| Catfish and bullheads | -------- | -------- | 41,300 | 2 064 | 790,600 | 58,448 |
| Chubs | 256,300 | 26,576 | -------- | -------- | 5,852,500 | 702,769 |
| Cisco | -------- | -------- | -------- | -------- | 845,800 | 102,732 |
| Crappie | -------- | -------- | 400 | 16 | 400 | 16 |
| Eels, common | -------- | -------- | -------- | -------- | 44,300 | 2,658 |
| Garfish | -------- | -------- | -------- | -------- | 5,900 | 59 |
| Goldfish | -------- | -------- | -------- | -------- | 214,700 | 8,588 |
| Lake herring | 10,593,700 | 288,334 | 16,900 | 330 | 20,522,900 | 634.695 |
| Lake trout | 3,166.900 | 452,715 | -------- | -------- | 9,359,600 | 1,496,871 |
| Mooneye | -------- | -------- | -------- | -------- | 11,300 | 452 |
| Pike or pickerel (jacks) | 5,100 | 504 | 168,000 | 12,687 | 231,100 | 18,991 |
| Rock bass | -------- | -------- | -------- | -------- | 38,300 | 2,298 |
| Sauger | -------- | -------- | 87,900 | 6,290 | 934,800 | 90,974 |
| Sheepshead | -------- | -------- | -------- | -------- | 3,416,700 | 100,723 |
| Smelt | 4,300 | 129 | -------- | -------- | 1,845,800 | 55,374 |
| Steelhead trout | -------- | -------- | -------- | -------- | 1,200 | 240 |
| Sturgeon | -------- | -------- | 100 | 25 | 30,900 | 10,196 |
| Sucker "mullet" | 288,700 | 8,647 | 182,300 | 3,642 | 5,001,900 | 154,701 |
| Sunfish | -------- | -------- | -------- | -------- | 44,100 | 2,646 |
| Tullibees | -------- | -------- | 878,400 | 43,915 | 878.400 | 43,915 |
| White bass | -------- | -------- | -------- | -------- | 735,700 | 43,430 |
| Whitefish: | | | | | | |
| Common | 455,400 | 90.692 | 63,500 | 6,315 | 3,302,500 | 659,118 |
| Menominee | 23,500 | 2,180 | -------- | -------- | 153,400 | 15,170 |
| Yellow perch | 7,900 | 602 | 59,600 | 2,984 | 8,016,800 | 601,925 |
| Yellow pike | 45,400 | 4,540 | 411.000 | 40,064 | 4,998,900 | 498,854 |
| Crawfish | -------- | -------- | -------- | -------- | 6,000 | 450 |
| Mussel shells [1] | -------- | -------- | -------- | -------- | 299,000 | 6,003 |
| Pearls and slugs [1] | -------- | -------- | -------- | -------- | -------- | 79 |
| Total | 14,856,000 | 875,013 | 1,941,900 | 118,776 | 81,524,500 | 6,083,212 |

[1] From tributary streams.

## *Industries related to the fisheries of the Lake States, 1938*

### OPERATING UNITS, SALARIES, AND WAGES

| Item | New York | Pennsylvania | Ohio | Michigan | Indiana | Illinois | Wisconsin | Minnesota | Total |
|---|---|---|---|---|---|---|---|---|---|
| Transporting: | | | | | | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Persons engaged, on vessels | -------- | -------- | 21 | 9 | -------- | -------- | -------- | -------- | 30 |
| Vessels: | | | | | | | | | |
| Steam | -------- | -------- | 2 | -------- | -------- | -------- | -------- | -------- | 2 |
| Net tonnage | -------- | -------- | 63 | -------- | -------- | -------- | -------- | -------- | 63 |
| Motor | -------- | -------- | 12 | 3 | -------- | -------- | -------- | -------- | 15 |
| Net tonnage | -------- | -------- | 154 | 21 | -------- | -------- | -------- | -------- | 175 |
| Total vessels | -------- | -------- | 14 | 3 | -------- | -------- | -------- | -------- | 17 |
| Total net tonnage | -------- | -------- | 217 | 21 | -------- | -------- | -------- | -------- | 238 |
| Wholesale and manufacturing: | | | | | | | | | |
| Establishments | 17 | 6 | 48 | 45 | 3 | 46 | 36 | 13 | 214 |
| Persons engaged: | | | | | | | | | |
| Proprietors | 21 | 5 | 44 | 24 | 3 | 16 | 28 | 5 | 146 |
| Salaried employees | 33 | 8 | 76 | 76 | 2 | 211 | 49 | 31 | 486 |
| Wage earners: | | | | | | | | | |
| Average for season | 116 | 56 | 289 | 381 | 5 | 626 | 536 | 131 | 2,140 |
| Average for year | 79 | 39 | 208 | 193 | 5 | 500 | 187 | 57 | 1,268 |
| Paid to salaried employees | $42,832 | $15,825 | $168,475 | $146,364 | $1,920 | $568,974 | $196,830 | $40,955 | $1,182,175 |
| Paid to wage earners | $87,975 | $49,316 | $293,959 | $233,040 | $6,200 | $699,469 | $207,219 | $71,525 | $1,648,703 |
| Total salaries and wages | $130,807 | $65,141 | $462,434 | $379,404 | $8,120 | $1,268,443 | $404,049 | $112,480 | $2,830,878 |
| Fishermen manufacturing | -------- | -------- | 15 | 30 | -------- | 40 | 43 | 78 | 206 |

*Industries related to the fisheries of the Lake States, 1938*—Continued

PRODUCTS MANUFACTURED

| Item | New York | | Pennsylvania | | Ohio | | Indiana | |
|---|---|---|---|---|---|---|---|---|
| By manufacturing establishments: | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Alewives, spiced___pounds__ | (1) | (1) | --------- | --------- | (1) | (1) | --------- | --------- |
| Blue pike: | | | | | | | | |
| Fresh fillets_________do____ | 401,042 | $82,828 | 231,920 | $43,663 | 1,106,219 | $239,866 | --------- | --------- |
| Frozen fillets________do____ | 30,550 | 5,204 | 21,870 | 4,145 | 261,053 | 54,924 | --------- | --------- |
| Chub, cisco and tullibees, smoked__________pounds__ | (1) | (1) | --------- | --------- | (1) | (1) | 55,000 | $13,200 |
| Herring, lake, smoked_do____ | (1) | (1) | --------- | --------- | --------- | --------- | --------- | --------- |
| Lake trout: | | | | | | | | |
| Fresh fillets_________do____ | 2,509 | 697 | (1) | (1) | (1) | (1) | --------- | --------- |
| Smoked_______________do____ | --------- | --------- | --------- | --------- | --------- | --------- | 17,000 | 4,800 |
| Sablefish, smoked_____do____ | --------- | --------- | --------- | --------- | (1) | (1) | --------- | --------- |
| Salmon: | | | | | | | | |
| Kippered___________do____ | (1) | (1) | --------- | --------- | (1) | (1) | --------- | --------- |
| Smoked_____________do____ | (1) | (1) | --------- | --------- | (1) | (1) | --------- | --------- |
| Sauger: | | | | | | | | |
| Fresh fillets_________do____ | 57,226 | 13,201 | 20,100 | 3,987 | 152,100 | 36,393 | --------- | --------- |
| Frozen fillets________do____ | 35,132 | 5,973 | (1) | (1) | 61,000 | 14,100 | --------- | --------- |
| Sheepshead, smoked__do____ | --------- | --------- | --------- | --------- | 11,900 | 1,438 | --------- | --------- |
| White bass, fresh fillets pounds__ | (1) | (1) | 8,598 | 1,372 | 13,105 | 2,646 | --------- | --------- |
| Whitefish: | | | | | | | | |
| Fresh fillets_________do____ | (1) | (1) | (1) | (1) | (1) | (1) | --------- | --------- |
| Smoked_______________do____ | 34,000 | 11,900 | --------- | --------- | (1) | (1) | (1) | (1) |
| Yellow perch: | | | | | | | | |
| Fresh fillets_________do____ | 35,613 | 7,218 | 25,052 | 4,686 | 367,396 | 83,000 | --------- | --------- |
| Frozen fillets________do____ | --------- | --------- | --------- | --------- | 42,705 | 9,989 | --------- | --------- |
| Yellow pike: | | | | | | | | |
| Fresh fillets_________do____ | 20,502 | 6,419 | (1) | (1) | 59,534 | 14,021 | --------- | --------- |
| Frozen fillets________do____ | (1) | (1) | --------- | --------- | 10,950 | 2,975 | --------- | --------- |
| Unclassified products: | | | | | | | | |
| Fillets, fresh and frozen pounds__ | (2) | (2) | [3] 7,708 | [3] 2,131 | (2) | (2) | --------- | --------- |
| Smoked_______________do____ | [7] 274,000 | [7] 72,900 | --------- | --------- | [8] 149,500 | [8] 39,312 | (9) | (9) |
| Miscellaneous_____________ | --------- | [12] 26,809 | --------- | --------- | --------- | [13] 39,805 | --------- | --------- |
| Total___________________ | --------- | 233,149 | 315,248 | 59,984 | --------- | 538,469 | 72,000 | 18,000 |
| By fishermen: | | | | | | | | |
| Catfish and bullheads, smoked__________pounds__ | --------- | --------- | --------- | --------- | 10,000 | 2,000 | --------- | --------- |
| Carp, smoked__________do____ | --------- | --------- | --------- | --------- | 5,000 | 500 | --------- | --------- |
| Herring, lake, smoked_do____ | --------- | --------- | --------- | --------- | 1,000 | 100 | --------- | --------- |
| Sheepshead, smoked__do____ | --------- | --------- | --------- | --------- | 25,000 | 2,500 | --------- | --------- |
| Whitefish, smoked____do____ | --------- | --------- | --------- | --------- | 2,000 | 600 | --------- | --------- |
| Yellow pike, smoked__do____ | --------- | --------- | --------- | --------- | 2,000 | 400 | --------- | --------- |
| Total___________________ | --------- | --------- | --------- | --------- | 45,000 | 6,100 | --------- | --------- |
| Grand total_____________ | --------- | 233,149 | 315,248 | 59,984 | --------- | 544,569 | 72,000 | 18,000 |

| Item | Illinois | | Michigan | | Wisconsin | | Minnesota | |
|---|---|---|---|---|---|---|---|---|
| By manufacturing establishments: | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Alewives, spiced_pounds__ | 1,660,000 | $308,000 | --------- | --------- | 486,300 | $62,900 | (1) | (1) |
| Blue pike: | | | | | | | | |
| Fresh fillets______do____ | 433,514 | 92,802 | (1) | (1) | (1) | (1) | --------- | --------- |
| Frozen fillets_____do____ | (1) | (1) | --------- | --------- | --------- | --------- | --------- | --------- |
| Chub, cisco and tullibees, smoked_______pounds__ | 1,670,000 | 470,760 | 295,700 | $72,300 | 619,911 | 154,682 | 45,000 | $9,300 |
| Herring, lake: | | | | | | | | |
| Fresh fillets______do____ | (1) | (1) | (1) | (1) | 7,200 | 820 | --------- | --------- |
| Salted_____________do____ | --------- | --------- | 1,518,960 | 61,342 | (1) | (1) | 633,000 | 26,175 |
| Smoked___________do____ | (1) | (1) | 41,016 | 5,498 | 508,000 | 49,300 | 48,500 | 4,850 |
| Lake trout: | | | | | | | | |
| Fresh fillets______do____ | 4,029 | 1,016 | (1) | (1) | (1) | (1) | --------- | --------- |
| Smoked___________do____ | 87,785 | 23,435 | 108,659 | 36,631 | 207,000 | 54,252 | (1) | (1) |
| Sablefish, smoked__do____ | (1) | (1) | (1) | (1) | 65,100 | 13,788 | --------- | --------- |
| Salmon: | | | | | | | | |
| Kippered_________do____ | 69,700 | 22,855 | --------- | --------- | --------- | --------- | --------- | --------- |
| Smoked___________do____ | 666,000 | 257,370 | 303,308 | 60,814 | 137,000 | 29,160 | (1) | (1) |

See footnotes at end of table.

## *Industries related to the fisheries of the Lake States, 1938*—Continued

### PRODUCTS MANUFACTURED—Continued

| Item | Illinois | | Michigan | | Wisconsin | | Minnesota | |
|---|---|---|---|---|---|---|---|---|
| | *Quantito* | *Value* | *Quantito* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments—Continued. | | | | | | | | |
| Sauger: | | | | | | | | |
| Fresh fillets......do.... | 696,738 | $147,216 | | | 163,000 | $30,460 | | |
| Frozen fillets.....do.... | 478,170 | 105,575 | (1) | (1) | (1) | (1) | | |
| Whitefish: | | | | | | | | |
| Fresh fillets......do.... | 9,835 | 2,795 | | | (1) | (1) | | |
| Smoked..........do.... | | | 46,589 | $10,661 | (1) | (1) | (1) | (1) |
| Yellow perch: | | | | | | | | |
| Fresh fillets......do.... | 214,918 | 49,650 | (1) | (1) | 189,500 | 42,365 | | |
| Frozen fillets.....do.... | 50,107 | 11,760 | | | (1) | (1) | | |
| Yellow pike: | | | | | | | | |
| Fresh fillets............ | 199,823 | 41,738 | | | 64,000 | 14,140 | | |
| Frozen fillets.....do.... | 10,458 | 2,328 | | | 56,000 | 8,800 | | |
| Unclassified products: | | | | | | | | |
| Fillets, fresh and frozen pounds.. | [4] 34,127 | [4] 6,609 | [5] 215,260 | [5] 38,706 | [6] 69,300 | [6] 16,910 | | |
| Smoked..........do.... | [10] 128,506 | [10] 34,395 | (2) | (2) | [11] 40,000 | [11] 6,420 | (2) | (2) |
| Miscellaneous.......... | | [14] 211,147 | | [15] 7,790 | | [16] 68,566 | | [17] $34,730 |
| Total............... | | 1,789,751 | | 293,742 | | 552,593 | | 75,055 |
| By fishermen: | | | | | | | | |
| Chub, cisco, and tullibees, smoked.......pounds.. | 110,000 | 33,000 | 13,000 | 3,900 | 90,000 | 27,000 | | |
| Herring, lake: | | | | | | | | |
| Salted...........do.... | | | 150,000 | 4,500 | 20,000 | 800 | 125,000 | 5,000 |
| Smoked..........do.... | | | 2,000 | 200 | 20,000 | 2,000 | | |
| Lake trout, smoked.do.... | 45,000 | 15,750 | 12,500 | 3,750 | 5,000 | 1,500 | | |
| Sturgeon roe, salted.do.... | | | | | | | 25 | 20 |
| Suckers, smoked...do.... | | | 1,000 | 100 | | | | |
| Whitefish, smoked.do.... | | | 2,500 | 850 | | | | |
| Total............... | 155,000 | 48,750 | 181,000 | 13,300 | 135,000 | 31,300 | 125,025 | 5,020 |
| Grand total.......... | | 1,838,501 | | 307,042 | | 583,893 | | 80,075 |

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[1] The production of this item has been included under "Unclassified products."

[2] This item has been included under "Miscellaneous."

[3] Includes fresh fillets of lake trout, whitefish, and yellow pike; and frozen fillets of sauger.

[4] Includes fresh fillets of halibut, lake herring, red snapper, sheepshead, and suckers; and frozen fillets of blue pike, lake herring, lake trout, red snapper, and whitefish.

[5] Includes fresh fillets of blue pike, lake herring, lake trout, and yellow perch; and frozen fillets of lake herring and sauger.

[6] Includes fresh fillets of blue pike, lake trout, and whitefish; and frozen fillets of sauger and yellow perch.

[7] Includes smoked chub, cisco, eels, lake herring, salmon and tullibees; and kippered salmon.

[8] Includes smoked chub, cisco, tullibees, mooneye, sablefish, suckers, whitefish, and kippered salmon.

[9] Included with miscellaneous products in Illinois.

[10] Includes smoked buffalofish, carp, eels, lake herring, sea herring, sablefish, sturgeon, and shad.

[11] Includes smoked carp and whitefish.

[13] Includes fresh fillets of white bass, whitefish and whiting; frozen fillets of lake trout and yellow pike; and spiced alewives and sea herring.

[13] Includes fresh fillets of lake trout, red snapper, sole, and whitefish; frozen fillets of white bass; and spiced alewives and sea herring.

[14] Includes spiced sea herring, canned hard clam chowder, and a small production of smoked whitefish produced in Indiana.

[15] Includes smoked carp and sablefish, and spiced sea herring.

[16] Includes spiced chubs, lake herring, and sea herring; salted lake herring; canned whitefish caviar; burbot liver oil; and mussel-shell poultry feed and lime.

[17] Includes smoked lake trout, salmon, and whitefish; spiced alewives, and sea herring; and burbot liver oil.

NOTE.—The total value of the manufactured products for the Lake States was as follows: By manufacturing establishments, $3,560,743; and by fishermen, $104,470. Some of the above products may have been manufactured from products imported from another State or a foreign country; therefore, they cannot be correlated directly with the catch within the State. All but 10 of the persons engaged in the preparation of fishermen's manufactured products also have been included as fishermen. This should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## RECEIPTS OF FISHERY PRODUCTS AT CHICAGO, ILL.

Receipts of fishery products in the wholesale marketing area of Chicago, Ill., as collected and compiled by the Division's Fishery Market News Service, totaled 48,418,745 pounds during 1939; the largest receipts aggregating 5,658,461 pounds, occurring in October, and the smallest amounting to 2,553,876 pounds in February. Michigan, with shipments of 6,219,304 pounds, was the most important State supplying the Chicago market. Following in order were Wisconsin, Louisiana, Massachusetts, and Ohio. Among the Canadian Provinces, British Columbia, with 5,511,824 pounds, supplied the most fish to the Chicago market; however, 1,895,735 pounds of this quantity were captured by United States fishermen and shipped through British Columbia ports in bond. Second in importance among the Canadian Provinces was Manitoba with shipments of 4,917,324 pounds.

*Receipts of fresh and frozen fishery products at Chicago, Ill., 1939*

BY SPECIES AND MONTHS

| Species | January | February | March | April | May | June |
|---|---|---|---|---|---|---|
| FRESH-WATER FISH | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Blue pike | 2,240 | | 13,460 | 27,631 | 284,133 | 197,692 |
| Bowfin | 504 | | 1,024 | 254 | 319 | |
| Brook trout | 290 | 70 | 487 | 380 | 793 | 1,485 |
| Buffalofish | 49,248 | 12,332 | 57,486 | 73,199 | 69,912 | 38,673 |
| Bullheads | 21,205 | 11,048 | 4,920 | 11,682 | 36,485 | 16,101 |
| Burbot | | 407 | 149 | 229 | 54 | 7 |
| Carp | 109,280 | 98,806 | 192,425 | 174,355 | 210,266 | 130,088 |
| Catfish | 7,866 | 3,649 | 5,263 | 8,682 | 30,712 | 36,007 |
| Chubs | 88,940 | 50,330 | 46,755 | 59,755 | 83,022 | 87,834 |
| Cisco | | | | 3,010 | | |
| Eels | | 150 | 5,099 | 125 | 3,552 | 324 |
| Lake herring | 188,327 | 89,166 | 257,302 | 222,760 | 224,491 | 225,881 |
| Lake trout | 246,575 | 131,686 | 224,573 | 268,535 | 557,287 | 443,818 |
| Lake trout, frozen | | 1,257 | 36,119 | 3,666 | 1,345 | |
| Menominee | 305 | 228 | 625 | 5,293 | 3,172 | 2,231 |
| Pickerel (jacks) | 17,821 | 6,309 | 19,195 | 35,011 | 20,044 | 17,111 |
| Pickerel (jacks), frozen | | 4,370 | 6,928 | 774 | | |
| Rock bass | | | | 2,655 | 5,083 | 3,269 |
| Sauger | 744,817 | 378,763 | 465,429 | 160,959 | 28,350 | 20,703 |
| Sauger, frozen | 77,607 | 96,907 | 739,274 | 68,561 | | 16,855 |
| Sheepshead | 73,165 | 27,640 | 70,567 | 30,055 | 211,295 | 119,941 |
| Smelt | 7,991 | 68,604 | 179,314 | 498,287 | 29,634 | 44,051 |
| Smelt, frozen | 22,380 | 4,000 | | | | |
| Suckers | 52,568 | 46,299 | 35,983 | 111,284 | 81,342 | 108,966 |
| Tullibee fillets | | | | | | 270 |
| Tullibee, frozen | 5,810 | 39,899 | 182 | | | |
| Whitefish | 230,797 | 86,841 | 169,601 | 75,339 | 180,886 | 269,085 |
| Whitefish, frozen | 5,690 | 61,028 | 143,664 | 6,206 | 10,521 | 2,838 |
| Yellow perch | 213,318 | 92,599 | 157,337 | 199,922 | 241,055 | 101,751 |
| Yellow perch, frozen | 369 | 1,784 | 5,666 | 588 | | 14,393 |
| Yellow pike | 230,089 | 86,692 | 101,712 | 272,926 | 211,073 | 112,029 |
| Yellow pike, frozen | 6,076 | 4,045 | 23,582 | 10,195 | | 3,981 |
| Unclassified | 443 | 380 | 1,170 | 805 | 910 | |
| Total | 2,403,721 | 1,405,289 | 2,965,291 | 2,333,123 | 2,525,736 | 2,015,384 |

NOTE.—Includes all rail arrivals as reported by freight and express terminals, and truck receipts as reported by wholesale dealers, including smokers. Local cold-storage withdrawals and direct truck shipments to hotels, restaurants, chain stores, and other retailers are not included. Weights shown are for fishery products as received.

*Receipts of fresh and frozen fishery products at Chicago, Ill., 1939*—Continued

BY SPECIES AND MONTHS—Continued

| Species | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|
| FRESH-WATER FISH | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Blue pike | 54,094 | 122,740 | 44,895 | 94,703 | 195,012 | 63,872 | 1,100,472 |
| Bowfin | | | | | 180 | 150 | 2,431 |
| Brook trout | 70 | 100 | 788 | 858 | 484 | 110 | 5,915 |
| Buffalofish | 68,306 | 66,775 | 73,796 | 64,452 | 45,270 | 45,863 | 665,312 |
| Bullheads | 22,282 | 16,781 | 41,086 | 54,968 | 29,051 | 19,432 | 285,041 |
| Burbot | 60 | | | | 383 | 328 | 1,617 |
| Carp | 91,060 | 117,293 | 161,961 | 132,240 | 129,299 | 110,254 | 1,657,327 |
| Catfish | 30,744 | 30,660 | 29,766 | 23,833 | 33,451 | 18,146 | 258,779 |
| Chubs | 130,392 | 138,629 | 119,677 | 124,233 | 127,804 | 122,248 | 1,179,619 |
| Cisco | | 22,320 | | 115 | 1,955 | 3,349 | 30,749 |
| Crappie | | | 786 | 2,029 | 2,139 | 3,160 | 8,114 |
| Eels | 3,014 | 6,032 | 8,788 | 54,051 | 33,199 | 10,492 | 124,826 |
| Lake herring | 186,531 | 82,279 | 59,492 | 253,176 | 289.856 | 212,187 | 2,291,448 |
| Lake trout | 426,751 | 425,045 | 453,204 | 595,193 | 965,118 | 347,697 | 5,085,482 |
| Lake trout, frozen | | | 30,200 | 13,700 | | 73,875 | 160,162 |
| Menominee | 2,446 | 3,960 | 1,693 | 2,000 | 8,595 | 5,964 | 36,512 |
| Pickerel (jacks) | 24,810 | 21,431 | 37,992 | 42,957 | 23,534 | 22,386 | 288,601 |
| Pickerel (jacks), frozen | | | | | 1,400 | | 13,472 |
| Rock bass | 2,149 | 1,352 | 4,352 | 4,490 | 409 | 74 | 23,833 |
| Sauger | 3,560 | 1,936 | 64,923 | 229.081 | 26,579 | 85,242 | 2,210,342 |
| Sauger, frozen | 43,199 | 37,014 | 89,971 | 47,835 | 15,000 | 61,337 | 1,293,560 |
| Sheepshead | 49,609 | 21,617 | 28,216 | 58,336 | 27,084 | 31,506 | 749,031 |
| Smelt | 37,171 | 50,745 | 35,341 | 26,774 | 19,914 | 27,463 | 1,025,289 |
| Smelt, frozen | | | | | 1,880 | 684 | 28,944 |
| Suckers | 91,432 | 69,044 | 95,191 | 73,098 | 53,735 | 60,878 | 879,820 |
| Sunfish | 761 | 250 | 2,764 | 10,418 | 5,385 | 600 | 20,178 |
| Tullibee | | 14,925 | 25,376 | 21,680 | 400 | 703 | 63,084 |
| Tullibee fillets | 1,453 | 675 | 2,580 | 3,605 | 450 | | 9,033 |
| Tullibee, frozen | | | | | 7,470 | | 53,361 |
| White bass | 1,710 | 9,750 | 9,861 | 15,601 | 4,419 | 300 | 41,641 |
| Whitefish | 341,114 | 235,906 | 246,062 | 274,494 | 328,966 | 279,819 | 2,718,910 |
| Whitefish, frozen | | 28,316 | | 96,186 | | | 354,449 |
| Yellow perch | 158,326 | 191,966 | 204,348 | 308,971 | 262,812 | 327,309 | 2,459,714 |
| Yellow perch, frozen | | | | 750 | | | 23,550 |
| Yellow pike | 76,253 | 77,957 | 155,014 | 145,637 | 103,340 | 77,544 | 1,650,266 |
| Yellow pike, frozen | | | | 1,550 | 7,500 | | 56,929 |
| Unclassified | 1,637 | 4,238 | 6,366 | 6,660 | 4,602 | 5,976 | 33,187 |
| Total | 1,848,934 | 1,799,736 | 2,034,489 | 2,783,674 | 2,756,675 | 2,018,948 | 26,891,000 |

| Species | January | February | March | April | May | June |
|---|---|---|---|---|---|---|
| SALT-WATER FISH | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Bluefish | | | 58 | 400 | 4,700 | 750 |
| Butterfish | 320 | | | | 2,700 | 5,775 |
| Cod | 10,672 | 1,872 | 3,005 | 5,475 | 6,640 | 2,070 |
| Cod fillets, frozen | 80,000 | 9,660 | 39,050 | 35,430 | 31,885 | 29,590 |
| Croaker | | | 19,915 | | | |
| Flounders | 1,927 | 2,704 | 3,265 | 11,795 | 11,765 | 7,885 |
| Haddock | 7,838 | 2,150 | 4,575 | 14,175 | 3,525 | 3,030 |
| Haddock fillets, frozen | 34,750 | 30,885 | 19,885 | 30,830 | 31,000 | 23,310 |
| Halibut | | | | 274,207 | 679,791 | 358,175 |
| Halibut, frozen | 372,715 | 394,065 | 576,915 | 45,100 | | 82,538 |
| Herring, sea (sardine) | 7,900 | 2,000 | | 175 | | |
| Jewfish (warsaw) | 600 | 530 | | 1,000 | 1,200 | |
| Kingfish (king mackerel) | | 1,200 | | 100 | | |
| Mackerel | 3,200 | | 900 | 850 | 16,000 | 10,725 |
| Mullet | 100 | 200 | | | | |
| Pollock fillets, frozen | | 53,605 | 31,350 | 52,560 | 21,620 | 25,305 |
| Pompano | 2,891 | | | 375 | 1,492 | 118 |
| Rosefish fillets, frozen | 139,840 | 121,725 | 139,425 | 166,325 | 117,540 | 160,700 |
| Sablefish, frozen | 6,500 | 4,000 | 22,816 | | | |
| Salmon: | | | | | | |
| Chinook (king) | | | | 2,009 | 45,503 | 58,175 |
| Chinook (king), frozen | | 1,500 | | | | |
| Chum (fall), frozen | 10,500 | 33,000 | 2,000 | | | |
| Silver | | | | | | 4,950 |
| Silver, frozen | 8,000 | 9,500 | 17,000 | 7,800 | | |
| Unclassified, frozen | 82,901 | 20,650 | 69,244 | 9,150 | | |

*Receipts of fresh and frozen fishery products at Chicago, Ill., 1939*—Continued

BY SPECIES AND MONTHS—Continued

| Species | January | February | March | April | May | June |
|---|---|---|---|---|---|---|
| SALT-WATER FISH—continued | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Scup (porgy) | 1,600 | 1,275 | 300 | 875 | 3,400 | 4,535 |
| Sea bass | 200 | 500 | 580 | 1,700 | 2,267 | 11,359 |
| Shad |  |  | 1,705 | 27,578 | 23,076 |  |
| Shad, frozen |  | 700 | 25 |  |  |  |
| Snapper, red | 16,470 | 11,400 | 4,426 | 16,875 | 35,950 | 1,561 |
| Sole: |  |  |  |  |  |  |
| Gray | 2,226 | 150 | 100 | 1,043 | 100 |  |
| Lemon | 100 |  | 1,186 | 1,577 | 75 | 100 |
| Fillets |  |  |  | 1,200 | 600 | 500 |
| Fillets, frozen | 17,555 |  | 5,660 | 200 |  |  |
| Spanish mackerel | 3,200 | 1,000 | 50 |  | 500 |  |
| Swordfish, frozen |  |  |  | 1,256 | 4,200 |  |
| Whiting | 8,170 | 45,875 | 5,000 | 300 | 2,170 | 750 |
| Whiting fillets, frozen |  |  | 11,000 | 6,000 | 12,475 | 1,500 |
| Wolffish (catfish) |  | 1,000 |  |  |  |  |
| Unclassified | 9,770 | 1,702 | 2,425 | 4,285 | 5,175 | 3,710 |
| Total | 829,945 | 752,848 | 981,860 | 720,645 | 1,065,349 | 797,111 |
| SHELLFISH, ETC. |  |  |  |  |  |  |
| Bullfrogs |  | 600 | 1,224 | 2,344 | 192 |  |
| Clams: |  |  |  |  |  |  |
| Hard | 5,200 | 7,200 | 6,940 | 5,300 | 12,300 | 1,200 |
| Soft | 150 | 370 | 150 |  |  |  |
| Crabs: |  |  |  |  |  |  |
| Hard | 720 | 734 | 1,138 | 8.020 | 2,040 | 725 |
| Soft |  | 206 | 1,325 | 6,171 | 10,332 | 11,676 |
| Crab meat | 3,457 | 1,615 | 1,988 | 5,644 | 11,765 | 5,560 |
| Frog legs | 434 | 97 | 248 | 406 | 802 | 1,270 |
| Lobsters | 9,572 | 7,150 | 8,050 | 9,415 | 19,076 | 10,109 |
| Lobster meat |  |  | 169 | 50 | 548 | 300 |
| Oysters, shell | 116,300 | 57,900 | 56,600 | 53,000 |  | 600 |
| Oysters, shucked | 99,204 | 199,556 | 65,301 | 21,657 |  | 18 |
| Scallops, sea |  |  | 1,545 | 6,000 | 22,788 | 250 |
| Shrimp | 244,425 | 108,223 | 113,215 | 234,572 | 895,700 | 779,070 |
| Shrimp, frozen |  |  | 20,000 | 91,780 | 30,000 |  |
| Spiny lobster tails |  | 9,490 | 4,500 | 4,000 | 10,200 | 3,000 |
| Squid, frozen |  |  | 2,574 | 6,202 | 34,742 | 4,935 |
| Turtle, snapping |  | 2,495 |  | 1,793 |  | 588 |
| Turtle meat |  | 103 |  | 334 | 120 | 112 |
| Unclassified | 150 |  | 30 |  |  |  |
| Total | 479,612 | 395,739 | 284,997 | 456,688 | 1,050,605 | 819,413 |
| Grand total | 3,713,278 | 2,553,876 | 4,232,148 | 3,510,456 | 4,641,690 | 3,631,908 |

| Species | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|
| SALT-WATER FISH | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Bluefish | 525 | 900 | 494 | 910 | 2,555 | 15,070 | 26,362 |
| Butterfish | 6,490 | 2,400 | 1,202 | 1,150 | 800 | 1,400 | 22,237 |
| Cod | 1,825 | 5,640 | 5,900 | 11,380 | 3,641 | 4,295 | 62,415 |
| Cod fillets, frozen | 9,150 | 30,000 | 90,055 | 7,965 | 31,505 | 14,655 | 411,945 |
| Croaker | 9,000 | 1,500 | 1,500 | 15,360 |  |  | 47,275 |
| Flounders | 3,340 | 3,120 | 3,360 | 5,640 | 2,395 | 5,765 | 62,961 |
| Haddock | 16,155 | 3,275 | 5,031 | 5,625 | 3,881 | 13,105 | 82,365 |
| Haddock fillets, frozen | 66,300 | 59,500 | 92,765 | 17,250 | 19,000 | 75,870 | 501,345 |
| Halibut | 592,480 | 496,578 | 541,615 | 552,682 | 31,300 |  | 3,526,828 |
| Halibut, frozen | 30,000 | 64,792 | 228,988 | 339,191 | 628,447 | 435,334 | 3,198,085 |
| Herring, sea (sardine) | 7,300 |  | 19,400 |  | 31,500 | 4,000 | 72,275 |
| Jewfish (warsaw) |  | 800 | 1,310 | 1,575 | 1,000 | 2,170 | 10,185 |
| Kingfish (king mackerel) |  |  |  | 600 |  | 600 | 2,500 |
| Mackerel | 5,950 | 7,325 | 21,684 | 19,365 | 15,715 | 8,510 | 110,224 |
| Mackerel, frozen | 6,000 |  | 10,000 |  | 485 | 9,625 | 26,110 |
| Mullet |  |  | 400 | 3,072 | 5,307 | 4,350 | 13,429 |
| Pollock fillets, frozen | 7,500 | 6,000 |  | 1,500 | 31,120 | 34,650 | 265,210 |
| Pompano | 1,158 | 2,521 | 2,303 | 5,951 | 5,265 | 17,148 | 39,222 |
| Rosefish fillets, frozen | 117,000 | 167,000 | 254,930 | 279,550 | 168,230 | 106,690 | 1,938,955 |
| Sablefish, frozen |  |  |  | 9,800 | 6,845 |  | 49,961 |

*Receipts of fresh and frozen fishery products at Chicago, Ill., 1939*—Continued

BY SPECIES AND MONTHS—Continued

| Species | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|
| SALT-WATER FISH—continued | | | | | | | |
| Salmon: | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Chinook (king) | 49, 845 | 54, 944 | 20, 881 | 5, 822 | | | 237, 179 |
| Chinook (king), frozen | | | 700 | 38, 750 | 19, 300 | 25, 000 | 85, 250 |
| Chum (fall) | | | | 15, 200 | | | 15, 200 |
| Chum (fall), frozen | | 15, 000 | | 41, 600 | 53, 850 | 39, 325 | 195, 275 |
| Pink (humpback) | | 7, 500 | 21, 000 | | | | 28, 500 |
| Silver | 28, 200 | 41, 880 | 62, 329 | 129, 888 | 38, 397 | | 305, 644 |
| Silver, frozen | | 10, 000 | 1, 000 | 43, 000 | 39, 897 | 47, 738 | 183, 935 |
| Unclassified, frozen | | | | | | | 181, 945 |
| Scup (porgy) | 3, 200 | 1, 000 | 1, 250 | 7, 396 | 3, 575 | 5, 225 | 33, 631 |
| Sea bass | 5, 705 | 1, 300 | 700 | 1, 900 | 6, 819 | 1, 983 | 35, 013 |
| Sea trout, gray (weakfish) | | | 1, 800 | | | | 1, 800 |
| Shad | | | | | | | 52, 359 |
| Shad, frozen | | | | | | | 725 |
| Snapper, red | 11, 655 | 10, 150 | 12, 680 | 29, 054 | 16, 730 | 69, 838 | 236, 789 |
| Sole: | | | | | | | |
| Gray | | 450 | | 1, 950 | 400 | 2, 537 | 8, 956 |
| Lemon | 2, 800 | | | 650 | 300 | 150 | 6, 938 |
| Fillets | 4, 000 | | | | | | 6, 300 |
| Fillets, frozen | | | | | | 21, 594 | 45, 009 |
| Spanish mackerel | | | | 1, 000 | | 32, 170 | 37, 920 |
| Swordfish, frozen | | | | | 300 | 10, 000 | 15, 756 |
| Whiting | 3, 300 | 24, 500 | | 4, 780 | 200 | 12, 120 | 107, 165 |
| Whiting fillets, frozen | 7, 000 | 12, 061 | 15, 395 | 1, 500 | 9, 500 | 12, 000 | 88, 431 |
| Wolffish (catfish) | | 1, 500 | | 5, 130 | | 5, 140 | 12, 770 |
| Unclassified | 5, 566 | 9, 374 | 12, 461 | 14, 130 | 7, 882 | 6, 860 | 83, 340 |
| Total | 1, 001, 444 | 1, 041, 010 | 1, 431, 133 | 1, 620, 316 | 1, 189, 141 | 1, 044, 917 | 12, 475, 719 |
| SHELLFISH, ETC. | | | | | | | |
| Bullfrogs | | | | 115 | | | 4, 475 |
| Clams: | | | | | | | |
| Hard | 5, 650 | 3, 150 | 8, 651 | 21, 055 | 24, 505 | 38, 935 | 140, 086 |
| Soft | | | | 525 | 1, 061 | 373 | 2, 629 |
| Crabs: | | | | | | | |
| Hard | 1, 200 | 990 | 3, 632 | 4, 022 | 1, 068 | 1, 453 | 25, 742 |
| Soft | 3, 221 | 11, 067 | 5, 644 | 1, 760 | | | 51, 402 |
| Crab meat | 6, 152 | 5, 250 | 7, 347 | 11, 706 | 8, 718 | 10, 382 | 79, 584 |
| Crawfish | 925 | | 4, 656 | 875 | | | 6, 456 |
| Frog legs | 3, 418 | 2, 939 | 1, 166 | 4, 710 | 392 | 1, 893 | 17, 775 |
| Lobsters | 11, 850 | 10, 139 | 25, 494 | 31, 930 | 33, 078 | 29, 886 | 205, 749 |
| Lobster meat | | 609 | | | | | 1, 676 |
| Oysters, shell | | 3, 060 | 59, 580 | 143, 095 | 154, 460 | 98, 343 | 742, 938 |
| Oysters, shucked | | | 98, 959 | 188, 418 | 183, 033 | 229, 056 | 1, 085, 202 |
| Scallops, sea | 6, 643 | 1, 000 | 10, 228 | 18, 308 | 22, 810 | 14, 004 | 103, 576 |
| Shrimp | 528, 422 | 412, 750 | 409, 892 | 707, 874 | 749, 045 | 744, 516 | 5, 927, 704 |
| Shrimp, frozen | | | 29, 500 | 113, 540 | 93, 220 | 92, 724 | 470, 764 |
| Spiny lobster tails | 2, 600 | | 50 | 5, 200 | 19, 080 | 26, 315 | 84, 435 |
| Squid, frozen | 21, 200 | 2, 000 | 4, 351 | 400 | 11, 800 | 2, 000 | 90, 204 |
| Turtle, snapping | 1, 594 | | 340 | 938 | 6 | 2, 081 | 9, 835 |
| Turtle meat | | 750 | | | | 195 | 1, 614 |
| Unclassified | | | | | | | 180 |
| Total | 592, 875 | 453, 704 | 669, 490 | 1, 254, 471 | 1, 302, 276 | 1, 292, 156 | 9, 052, 026 |
| Grand total | 3, 443, 253 | 3, 294, 450 | 4, 135, 112 | 5, 658, 461 | 5, 248, 092 | 4, 356, 021 | 48, 418, 745 |

BY ORIGIN AND MONTHS

| Origin | January | February | March | April | May | June |
|---|---|---|---|---|---|---|
| DOMESTIC | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Alabama | 29, 335 | 14, 530 | 4, 226 | 11, 500 | 41, 600 | |
| Arkansas | | | 700 | 104 | 24 | |
| California | 92 | 94 | | 114 | 28, 612 | |
| Florida | 10, 237 | 5, 433 | 4, 133 | 8, 575 | 31, 562 | 2, 241 |
| Georgia | | | | | | |
| Illinois | 166, 303 | 102, 089 | 292, 601 | 224, 092 | 68, 247 | 28, 235 |
| Indiana | 18, 405 | 17, 022 | 35, 035 | 14, 660 | 4, 771 | 4, 952 |
| Iowa | 76, 688 | 9, 360 | 70, 403 | 81, 118 | 82, 286 | 62, 948 |
| Louisiana | 155, 089 | 48, 177 | 136, 779 | 252, 210 | 757, 170 | 602, 917 |
| Maine | 20, 676 | | 51, 641 | 47, 322 | 250 | 2, 400 |
| Maryland | 44, 239 | 105, 249 | 13, 757 | 29, 654 | 23, 096 | 11, 716 |
| Massachusetts | 180, 200 | 261, 537 | 164, 194 | 294, 045 | 284, 728 | 265, 279 |

*Receipts of fresh and frozen fishery products at Chicago, Ill., 1939*—Continued

BY ORIGIN AND MONTHS—Continued

| Origin | January | February | March | April | May | June |
|---|---|---|---|---|---|---|
| DOMESTIC—continued | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Michigan | 270, 875 | 99, 011 | 235, 280 | 564, 619 | 767, 710 | 621, 597 |
| Minnesota | 167, 811 | 23, 690 | 9, 412 | 53, 646 | 53, 936 | 113, 787 |
| Mississippi | 14, 208 | 14, 395 | 1, 050 | ---------- | ---------- | 588 |
| Missouri | 443 | 2, 175 | 2, 118 | 380 | 543 | 985 |
| New Jersey | 22, 722 | 11, 335 | 16, 205 | 1, 675 | 5, 400 | 150 |
| New York | 102, 750 | 47, 980 | 76, 590 | 70, 670 | 61, 272 | 42, 412 |
| North Carolina | 2, 880 | 934 | 2, 017 | 4, 722 | 2, 895 | ---------- |
| Ohio | 2, 500 | 300 | 32, 030 | 398, 180 | 757, 495 | 358, 071 |
| Oregon | 710 | 724 | 1, 138 | 920 | 1, 478 | 725 |
| Pennsylvania | ---------- | ---------- | ---------- | 14, 296 | 9, 684 | 10, 052 |
| Rhode Island | ---------- | ---------- | 600 | 1, 000 | ---------- | ---------- |
| South Carolina | ---------- | 450 | ---------- | 130 | 310 | ---------- |
| Texas | 67, 690 | 45, 648 | ---------- | 88, 025 | 150, 345 | 181, 282 |
| Virginia | 49, 830 | 110, 748 | 74, 617 | 28, 923 | 14, 390 | 2, 732 |
| Washington | 71, 250 | 25, 000 | 56, 292 | 33, 719 | 120, 694 | 56, 155 |
| Wisconsin | 264, 494 | 329, 292 | 506, 208 | 810, 466 | 609, 824 | 535, 771 |
| Alaska | 220, 989 | 136, 000 | 263, 346 | 44, 000 | 118, 312 | 102, 000 |
| Total | 1, 960, 416 | 1, 411, 173 | 2, 050, 372 | 3, 078, 765 | 3, 996, 634 | 3, 006, 995 |
| IMPORTED | | | | | | |
| Alberta | 195, 100 | 68, 786 | 203, 253 | 39, 615 | ---------- | 101, 500 |
| British Columbia [1] | 191, 377 | 301, 715 | 369, 337 | 264, 747 | 487, 848 | 346, 183 |
| British Columbia (in bond) [2] | (3) | (3) | (3) | (3) | (3) | (3) |
| Manitoba | 1, 193, 443 | 683, 468 | 1, 370, 728 | 86, 324 | 19, 375 | 57, 176 |
| New Brunswick | 24, 982 | 2, 150 | 1, 500 | 150 | 360 | 1, 200 |
| Nova Scotia | 133, 840 | 23, 885 | 46, 400 | ---------- | 198 | ---------- |
| Ontario | 5, 933 | 14, 064 | 21, 452 | 40, 855 | 137, 275 | 118, 854 |
| Saskatchewan | 8, 187 | 48, 635 | 169, 106 | ---------- | ---------- | ---------- |
| Total | 1, 752, 862 | 1, 142, 703 | 2, 181, 776 | 431, 691 | 645, 056 | 624, 913 |
| Grand total | 3, 713, 278 | 2, 553, 876 | 4, 232, 148 | 3, 510, 456 | 4, 641, 690 | 3, 631, 908 |

| Origin | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|
| DOMESTIC | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Alabama | 19, 160 | 10, 050 | 2, 810 | 55, 580 | 19, 260 | 51, 019 | 259, 070 |
| Arkansas | ---------- | ---------- | ---------- | ---------- | 104 | ---------- | 932 |
| California | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 28, 912 |
| Colorado | ---------- | ---------- | 114 | 196 | 96 | 30 | 436 |
| Connecticut | ---------- | ---------- | 5, 845 | 2, 735 | 7, 308 | 1, 406 | 17, 294 |
| Delaware | ---------- | ---------- | ---------- | 180 | ---------- | ---------- | 180 |
| Florida | 5, 457 | 4, 065 | 16, 869 | 24, 740 | 26, 302 | 104, 786 | 244, 400 |
| Georgia | ---------- | ---------- | 128 | 9 | ---------- | ---------- | 137 |
| Illinois | 49, 704 | 98, 783 | 72, 587 | 144, 265 | 203, 219 | 158, 661 | 1, 608, 786 |
| Indiana | 5, 252 | 1, 510 | 10, 597 | 2, 338 | 31, 697 | 23, 717 | 169, 956 |
| Iowa | 97, 328 | 69, 797 | 89, 804 | 143, 558 | 84, 938 | 92, 251 | 960, 479 |
| Louisiana | 414, 312 | 394, 820 | 121, 653 | 209, 446 | 533, 992 | 652, 488 | 4, 279, 053 |
| Maine | 5, 525 | 300 | 26, 359 | 12, 199 | 63, 901 | 45, 650 | 276, 223 |
| Maryland | 2, 131 | 11, 567 | 12, 887 | 10, 833 | 16, 855 | 9, 123 | 291, 107 |
| Massachusetts | 231, 313 | 313, 430 | 416, 397 | 416, 997 | 315, 201 | 227, 206 | 3, 370, 527 |
| Michigan | 467, 263 | 455, 049 | 559, 016 | 609, 938 | 910, 614 | 658, 302 | 6, 219, 304 |
| Minnesota | 156, 502 | 186, 134 | 213, 453 | 430, 123 | 167, 836 | 164, 597 | 1, 740, 927 |
| Mississippi | 21, 085 | 64 | ---------- | 2, 136 | 1, 111 | 1, 332 | 55, 969 |
| Missouri | 70 | 152 | 156 | 90 | 486 | 80 | 7, 678 |
| New Jersey | ---------- | ---------- | 34, 805 | 64, 872 | 40, 340 | 71, 900 | 269, 404 |
| New York | 43, 895 | 10, 311 | 87, 616 | 163, 787 | 178, 230 | 102, 375 | 987, 888 |
| North Carolina | 295 | 400 | 1, 052 | 1, 909 | 12, 259 | 7, 561 | 36, 924 |
| Ohio | 149, 317 | 165, 819 | 141, 914 | 152, 333 | 306, 907 | 24, 298 | 2, 489, 164 |
| Oregon | 1, 200 | 720 | 240 | 60, 756 | 26, 630 | 684 | 95, 925 |
| Pennsylvania | 628 | 14, 963 | 18, 850 | 16, 988 | 18, 086 | 17, 950 | 121, 497 |
| Rhode Island | ---------- | ---------- | 1, 260 | 13, 890 | ---------- | 5, 985 | 22, 735 |
| South Carolina | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 890 |

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[1] Includes "in bond" shipment prior to September.

[2] Consists of catch taken by United States vessels and shipped in bond through British Columbia ports to Chicago.

[3] Data not available.

*Receipts of fresh and frozen fishery products at Chicago, Ill., 1939*—Continued

BY ORIGIN AND MONTHS—Continued

| Origin | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|
| DOMESTIC—continued | *Pounds* | *Pounds* | *Peunds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Texas | 93,740 | 26,000 | 327,710 | 589,021 | 311,545 | 192,610 | 2,073,616 |
| Virginia | 15,550 | 5,580 | 53,234 | 127,960 | 142,971 | 192,948 | 819,483 |
| Washington | 66,800 | 80,483 | 191,147 | 199,172 | 134,093 | 81,503 | 1,116,308 |
| Wisconsin | 454,746 | 392,993 | 421,808 | 476,768 | 525,671 | 436,589 | 5,764,630 |
| Alaska | 101,000 | 75,000 | 35,698 | 80,917 | 90,000 | 57,253 | 1,324,515 |
| Total | 2,402,273 | 2,317,990 | 2,864,039 | 4,013,736 | 4,169,652 | 3,382,304 | 34,654,349 |
| IMPORTED | | | | | | | |
| Alberta | 111,850 | 112,850 | 135,150 | ---------- | ---------- | 73,875 | 1,041,979 |
| British Columbia [1] | 532,725 | 535,331 | 193,563 | 279,499 | 46,597 | 67,167 | 3,616,089 |
| British Columbia (in bond) [2] | (3) | (3) | 456,297 | 556,986 | 522,159 | 360,293 | 1,895,735 |
| Manitoba | 245,734 | 188,519 | 269,265 | 462,022 | 87,008 | 254,262 | 4,917,324 |
| New Brunswick | 2,800 | 3,799 | 5,591 | 8,350 | 9,100 | 9,150 | 69,132 |
| Nova Scotia | 38,800 | 26,000 | 109,600 | ---------- | 23,120 | 111,788 | 513,631 |
| Ontario | 104,236 | 104,683 | 93,584 | 258,548 | 360,514 | 86,925 | 1,346,923 |
| Quebec | 2,235 | 5,278 | 7,188 | 52,570 | 29,942 | 10,257 | 107,470 |
| Saskatchewan | 2,600 | ---------- | 835 | 26,750 | ---------- | ---------- | 256,113 |
| Total | 1,040,980 | 976,460 | 1,271,073 | 1,644,725 | 1,078,440 | 973,717 | 13,764,396 |
| Grand total | 3,443,253 | 3,294,450 | 4,135,112 | 5,658,461 | 5,248,092 | 4,356,021 | 48,418,745 |

[1] Includes "in bond" shipments prior to September.

[2] Consists of catch taken by United States vessels and shipped in bond through British Columbia ports to Chicago.

[3] Data not available.

## FISHERIES OF THE MISSISSIPPI RIVER AND TRIBUTARIES

The most recent complete catch statistics of the fisheries for the States of the Mississippi River and tributaries are those collected for the year 1931. The yield of fishery products in that year amounted to 82,382,523 pounds, valued at $2,897,357, which was a decrease of 22 percent in quantity and 36 percent in value as compared with the quantity and value of the catch in 1922, when the most recent preceding survey was made. Detailed statistics of the fisheries of the Mississippi River and tributaries for 1931 appear in "Fishery Industries of the United States, 1932," by R. H. Fiedler, Appendix III to the Report of the Commissioner of Fisheries for the fiscal year 1933.

A summary of these fisheries in 1931 has been published in the Bureau's annual reports entitled, "Fishery Industries of the United States," by R. H. Fiedler, for the years from 1933 to 1938 inclusive. Information regarding the production of cured manufactured products in the Mississippi River area in 1931 and of mussel-shell products for 1938 appear in the following table. Data on the fisheries of Lakes Pepin and Keokuk and the Mississippi River between the two Lakes for 1938 are shown in succeeding tables.

*Industries related to the fisheries of the Mississippi River and tributaries*

PRODUCTS MANUFACTURED

| Item | Indiana | | Illinois, Iowa, and Missouri | | Louisiana | |
|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments: | | | | | | |
| Salmon, smoked ........ pounds | | | 240,000 | $48,800 | | |
| Sturgeon, smoked ........ do | | | 162,000 | 39,140 | | |
| Mussel-shell products: | | | | | | |
| Buttons [2] ........ gross | | | 8,376,261 | 2,189,481 | | |
| Poultry feed [2] ........ tons | | | 4,083 | 23,282 | | |
| Lime [2] ........ do | | | 1,064 | 998 | | |
| Unclassified [2] ........ | | | | [3] 22,390 | | |
| Unclassified, smoked ........ pounds | | | [4] 83,000 | [4] 14,440 | | |
| Total ........ | | | | 2,338,531 | | |
| By fishermen: | | | | | | |
| Alligator hides ........ pounds | | | | | 88,356 | $7,363 |
| Carp, smoked ........ do | | | 667 | 67 | | |
| Paddlefish roe, salted ........ do | 450 | $180 | 900 | 540 | | |
| Sheepshead, smoked ........ do | | | 617 | 77 | | |
| Sturgeon: | | | | | | |
| Smoked ........ do | | | 1,333 | 400 | | |
| Roe, salted ........ do | | | 35 | 32 | | |
| Total ........ | 450 | 180 | 3,552 | 1,116 | 88,356 | 7,363 |
| Grand total ........ | 450 | 180 | | 2,339,647 | 88,356 | 7,363 |

| Item | Minnesota and Nebraska | | Mississippi | | Ohio, Tennessee, and Pennsylvania | |
|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| By manufacturing establishments: | | | | | | |
| Chubs, smoked ........ pounds | | | | | 106,600 | $26,650 |
| Salmon, smoked ........ do | (1) | (1) | | | (1) | (1) |
| Sturgeon, smoked ........ do | (1) | (1) | | | | |
| Whitefish, smoked ........ do | 255,000 | $47,200 | | | (1) | (1) |
| Unclassified, smoked ........ do | [5] 66,600 | [5] 19,793 | | | [6] 184,900 | [6] 50,555 |
| Total ........ | 321,600 | 66,993 | | | 291,500 | 77,205 |
| By fishermen: | | | | | | |
| Paddlefish roe, salted ........ pounds | | | 245 | $92 | | |
| Grand total ........ | 321,600 | 66,993 | 245 | 92 | 291,500 | 77,205 |

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[1] The production of this item is included under unclassified products.

[2] Data are for 1938.

[3] Includes mussel-shell chips and novelties.

[4] Includes smoked buffalofish and tullibees.

[5] Includes smoked eels, salmon, and sturgeon.

[6] Includes smoked buffalofish, butterfish, carp, lake trout, paddlefish, sablefish, salmon, tullibees, and whitefish.

NOTE.—Unless otherwise indicated, the data are for 1931. The total value of the manufactured products for the States of the Mississippi River and tributaries was as follows: By manufacturing establishments, $2,482,729; and by fishermen, $8,751. Some of the products may have been manufactured from fishery products imported from another State or a foreign country; therefore, they cannot be correlated directly with the catch within the State.

## LAKE PEPIN

### *Fisheries of Lake Pepin, 1938*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Stake gill nets | Trot lines | Total, exclusive of duplication |
|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* |
| Regular | 33 | 29 | | 33 |
| Casual | 10 | 44 | 25 | 63 |
| Total | 43 | 73 | 25 | 96 |
| Boats: | | | | |
| Motor | 15 | 31 | 12 | 35 |
| Other | 3 | 17 | 13 | 25 |
| Apparatus: | | | | |
| Number | 15 | 560 | 25 | |
| Length, yards | 5,832 | | | |
| Square yards | | 57,608 | | |
| Hooks | | | 2,500 | |

CATCH: BY GEAR

| Species | Haul seines | | Stake gill nets | | Trot lines | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | 3,600 | $51 | | | | | 3,600 | $51 |
| Buffalofish | 27,900 | 1,115 | 10,100 | $505 | | | 38,000 | 1,620 |
| Carp | 321,500 | 8,035 | 264,100 | 10,142 | 2,300 | $86 | 587,900 | 18,263 |
| Catfish and bullheads | 69,500 | 5,553 | 700 | 35 | 9,500 | 760 | 79,700 | 6,348 |
| Mooneye | 1,500 | 43 | | | | | 1,500 | 43 |
| Sheepshead | 47,000 | 1,880 | 300 | 10 | 800 | 27 | 48,100 | 1,917 |
| Sucker "mullet" | 26,000 | 391 | | | | | 26,000 | 391 |
| Total | 497,000 | 17,068 | 275,200 | 10,692 | 12,600 | 873 | 784,800 | 28,633 |

OPERATING UNITS: BY STATES

| Item | Minnesota | Wisconsin | Total for lake |
|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* |
| Regular | | 33 | 33 |
| Casual | 9 | 54 | 63 |
| Total | 9 | 87 | 96 |
| Boats: | | | |
| Motor | 4 | 31 | 35 |
| Other | 5 | 20 | 25 |
| Apparatus: | | | |
| Haul seines | | 15 | 15 |
| Length, yards | | 5,832 | 5,832 |
| Stake gill nets | | 560 | 560 |
| Square yards | | 57,608 | 57,608 |
| Trot lines | 9 | 16 | 25 |
| Hooks | 900 | 1,600 | 2,500 |

CATCH: BY STATES

| Species | Minnesota | | Wisconsin | | Total | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | | | 3,600 | $51 | 3,600 | $51 |
| Buffalofish | | | 38,000 | 1,620 | 38,000 | 1,620 |
| Carp | 1,000 | $60 | 586,900 | 18,203 | 587,900 | 18,263 |
| Catfish and bullheads | 1,500 | 150 | 78,200 | 6,198 | 79,700 | 6,348 |
| Mooneye | | | 1,500 | 43 | 1,500 | 43 |
| Sheepshead | | | 48,100 | 1,917 | 48,100 | 1,917 |
| Sucker "mullet" | | | 26,000 | 391 | 26,000 | 391 |
| Total | 2,500 | 210 | 782,300 | 28,423 | 784,800 | 28,633 |

## LAKE KEOKUK

### *Fisheries of Lake Keokuk, 1938*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Trammel nets | Trot lines | Fyke nets | Total, exclusive of duplication |
|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| Regular | 7 | 7 | 1 | 19 | 22 |
| Casual | 13 | 21 | 8 | 34 | 60 |
| Total | 20 | 28 | 9 | 53 | 82 |
| Boats: | | | | | |
| Motor | 6 | 11 | 4 | 24 | 34 |
| Other | 7 | 11 | 5 | 18 | 29 |
| Apparatus: | | | | | |
| Number | 9 | 18 | 45 | 740 | |
| Length, yards | 1,598 | | | | |
| Square yards | | 3,928 | | | |
| Hooks | | | 4,500 | | |

CATCH: BY GEAR

| Species | Haul seines | | Trammel nets | | Trot lines | | Fyke nets | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | | | | | | | 100 | $2 | 100 | $2 |
| Buffalofish | 31,500 | $1,260 | 8,000 | $340 | | | 72,900 | 2,228 | 112,400 | 3,828 |
| Carp | 100,000 | 2,000 | 91,000 | 1,820 | 1,700 | $40 | 156,000 | 3,120 | 348,700 | 6,980 |
| Catfish and bullheads | 5,000 | 419 | 1,500 | 140 | 6,000 | 500 | 57,700 | 5,670 | 70,200 | 6,729 |
| Paddlefish or spoonbill cat | 2,400 | 192 | | | | | | | 2,400 | 192 |
| Sheepshead | 42,000 | 2,100 | 5,000 | 250 | 1,200 | 60 | 29,100 | 1,455 | 77,300 | 3,865 |
| Total | 180,900 | 5,971 | 105,500 | 2,550 | 8,900 | 600 | 315,800 | 12,475 | 611,100 | 21,596 |

OPERATING UNITS: BY STATES

| Item | Illinois | Iowa | Total for lake |
|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* |
| Regular | 12 | 10 | 22 |
| Casual | 29 | 31 | 60 |
| Total | 41 | 41 | 82 |
| Boats: | | | |
| Motor | 18 | 16 | 34 |
| Other | 12 | 17 | 29 |
| Apparatus: | | | |
| Haul seines | 1 | 8 | 9 |
| Length, yards | 333 | 1,265 | 1,598 |
| Trammel nets | | 18 | 18 |
| Square yards | | 3,928 | 3,928 |
| Trot lines | 35 | 10 | 45 |
| Hooks | 3,500 | 1,000 | 4,500 |
| Fyke nets | 540 | 200 | 740 |

CATCH: BY STATES

| Species | Illinois | | Iowa | | Total | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | 100 | $2 | | | 100 | $2 |
| Buffalofish | 64,900 | 1,906 | 47,500 | $1,922 | 112,400 | 3,828 |
| Carp | 149,700 | 2,995 | 199,000 | 3,985 | 348,700 | 6,980 |
| Catfish and bullheads | 46,700 | 4,520 | 23,500 | 2,209 | 70,200 | 6,729 |
| Paddlefish or spoonbill cat | | | 2,400 | 192 | 2,400 | 192 |
| Sheepshead | 46,300 | 2,315 | 31,000 | 1,550 | 77,300 | 3,865 |
| Total | 307,700 | 11,738 | 303,400 | 9,858 | 611,100 | 21,596 |

## MISSISSIPPI RIVER BETWEEN LAKE PEPIN AND LAKE KEOKUK

*Fisheries of the Mississippi River between Lake Pepin and Lake Keokuk, 1938*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Stake gill nets | Trammel nets | Trot lines | Fyke nets | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Regular | 84 | 32 | 11 | 1 | 111 | 178 |
| Casual | 145 | 102 | 64 | 87 | 205 | 513 |
| Total | 229 | 134 | 75 | 88 | 316 | 691 |
| Boats: | | | | | | |
| Motor | 82 | 34 | 42 | 12 | 172 | 282 |
| Other | 61 | 42 | 15 | 76 | 104 | 256 |
| Apparatus: | | | | | | |
| Number | 93 | 982 | 58 | 204 | 4,170 | |
| Length, yards | 17,586 | | | | | |
| Square yards | | 93,400 | 9,642 | | | |
| Hooks | | | | 16,975 | | |

CATCH: BY GEAR

| Species | Haul seines | | Stake gill nets | | Trammel nets | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | 146,300 | $2,605 | 10,900 | $262 | | |
| Buffalofish | 297,300 | 13,128 | 62,200 | 3,152 | 40,500 | $1,965 |
| Carp | 898,900 | 22,000 | 539,800 | 19,744 | 129,600 | 2,913 |
| Catfish and bullheads | 39,100 | 2,583 | 5,900 | 509 | 9,000 | 880 |
| Garfish | 3,100 | 20 | 800 | 6 | | |
| Mooneye | 10,200 | 227 | | | 400 | 6 |
| Paddlefish or spoonbill cat | 500 | 48 | | | | |
| Pike or pickerel | 2,900 | 170 | | | | |
| Sheepshead | 185,200 | 9,044 | 8,800 | 383 | 13,800 | 665 |
| Sturgeon, shovelnose | | | | | 48,500 | 3,926 |
| Sucker "mullet" | 20,600 | 381 | 4,500 | 89 | 600 | 12 |
| Total | 1,604,100 | 50,206 | 632,900 | 24,145 | 242,400 | 10,367 |

| Species | Trot lines | | Fyke nets | | Total | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | 100 | $4 | 102,100 | $1,654 | 259,400 | $4,525 |
| Buffalofish | 800 | 35 | 567,700 | 26,271 | 968,500 | 44,551 |
| Carp | 13,700 | 477 | 696,200 | 15,149 | 2,278,200 | 60,283 |
| Catfish and bullheads | 35,800 | 3,483 | 460,500 | 32,291 | 550,300 | 39,746 |
| Eels, common | | | 1,000 | 91 | 1,000 | 91 |
| Garfish | 600 | 4 | | | 4,500 | 30 |
| Mooneye | | | 1,000 | 30 | 11,600 | 263 |
| Paddlefish or spoonbill cat | | | | | 500 | 48 |
| Pike or pickerel | | | 41,200 | 2,473 | 44,100 | 2,643 |
| Sheepshead | 8,800 | 465 | 205,500 | 9,419 | 422,100 | 19,976 |
| Sturgeon, shovelnose | 900 | 85 | 2,500 | 214 | 51,900 | 4,225 |
| Sucker "mullet" | | | 48,200 | 985 | 73,900 | 1,467 |
| Turtles, snapper | | | 7,400 | 148 | 7,400 | 148 |
| Total | 60,700 | 4,553 | 2,133,300 | 88,725 | 4,673,400 | 177,996 |

*Fisheries of the Mississippi River between Lake Pepin and Lake Keokuk, 1938*—Con.

OPERATING UNITS: BY STATES

| Item | Illinois | Iowa | Minnesota | Wisconsin | Total |
|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| Regular | 39 | 96 | 10 | 33 | 178 |
| Casual | 80 | 226 | 57 | 150 | 513 |
| Total | 119 | 322 | 67 | 183 | 691 |
| Boats: | | | | | |
| Motor | 58 | 160 | 9 | 55 | 282 |
| Other | 64 | 110 | 40 | 42 | 256 |
| Apparatus: | | | | | |
| Haul seines | 22 | 29 | 6 | 36 | 93 |
| Length, yards | 2, 456 | 6, 564 | 1, 700 | 6, 866 | 17, 586 |
| Stake gill nets | | | 159 | 823 | 982 |
| Square yards | | | 15, 900 | 77, 500 | 93, 400 |
| Trammel nets | | 58 | | | 58 |
| Square yards | | 9, 642 | | | 9, 642 |
| Trot lines | 76 | 89 | 39 | | 204 |
| Hooks | 7, 350 | 5, 725 | 3, 900 | | 16, 975 |
| Fyke nets | 887 | 2, 519 | | 764 | 4, 170 |

CATCH: BY STATES

| Species | Illinois | | Iowa | | Minnesota | | Wisconsin | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bowfin | 400 | $6 | 159, 300 | $2, 441 | 3, 000 | $164 | 96, 700 | $1, 914 | 259, 400 | $4, 525 |
| Buffalofish | 197, 200 | 8, 540 | 598, 400 | 27, 790 | 20, 700 | 937 | 152. 200 | 7, 284 | 968, 500 | 44, 551 |
| Carp | 359, 400 | 7, 927 | 1, 135, 800 | 23, 614 | 113, 400 | 4, 049 | 669, 600 | 24, 693 | 2, 278, 200 | 60, 283 |
| Catfish and bullheads | 94, 100 | 8, 942 | 431, 900 | 28, 490 | 17, 200 | 1, 651 | 7, 100 | 663 | 550, 300 | 39, 746 |
| Eels, common | | | 1, 000 | 91 | | | | | 1, 000 | 91 |
| Garfish | | | | | 4, 500 | 30 | | | 4, 500 | 30 |
| Mooneye | 3, 600 | 91 | 3, 200 | 52 | | | 4, 800 | 120 | 11, 600 | 263 |
| Paddlefish or spoonbill cat | | | 500 | 48 | | | | | 500 | 48 |
| Pike or pickerel | | | 44, 100 | 2, 643 | | | | | 44, 100 | 2, 643 |
| Sheepshead | 104, 100 | 5, 230 | 274, 700 | 12, 729 | 7, 100 | 350 | 36, 200 | 1, 667 | 422, 100 | 19, 976 |
| Sturgeon, shovelnose | | | 51, 000 | 4, 140 | 900 | 85 | | | 51, 900 | 4, 225 |
| Sucker "mullet" | 1, 500 | 39 | 44, 200 | 902 | 1, 300 | 28 | 26, 900 | 498 | 73, 900 | 1, 467 |
| Turtles, snapper | 200 | 4 | 7, 200 | 144 | | | | | 7, 400 | 148 |
| Total | 760, 500 | 30, 779 | 2, 751, 300 | 103, 084 | 168, 100 | 7, 294 | 993, 500 | 36, 839 | 4, 673. 400 | 177, 996 |

## FISHERIES OF ALASKA[14]

The commercial catch of fishery products in Alaska during 1938, exclusive of whales, amounted to 793,948,431 pounds valued at $12,040,022, which is a decrease of 4 percent in quantity and 15 percent in value as compared with the catch in 1937. Of the total catch in 1938, 589,705,625 pounds, valued at $9,943,090, consisted of salmon; 201,717,150 pounds, valued at $1,937,902, consisted of other fish; and 2,525,656 pounds, valued at $159,030, consisted of shellfish. In addition, 173 whales were taken. These fisheries gave employment to 11,007 fishermen, 1,923 persons on transporting craft, and 15,154 persons in fishery wholesale and manufacturing industries—a total of 28,084 persons, which is a decrease of 7 percent as compared with the number employed in 1937.

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[14] Statistics for the fisheries of Alaska are collected and compiled by the Alaska Division of this Bureau. A summary of these statistics appears in this section. For detailed figures the reader is referred to "Alaska Fishery and Fur-Seal Industries in 1938," by Ward T. Bower, Administrative Report No. 36, Appendix II to the report of the Commissioner of Fisheries for the year 1939.

## *Fisheries of Alaska, 1938*

### SUMMARY: BY DISTRICTS

| Item | Southeast Alaska |  | Central Alaska |  | Western Alaska |  | Total |  |
|---|---|---|---|---|---|---|---|---|
| PERSONS ENGAGED | *Number* | *Value* | *Number* | *Value* | *Number* | *Value* | *Number* | *Value* |
| In fishing | 4, 926 |  | 3, 030 |  | 3, 051 |  | 11, 007 |  |
| In transporting | 833 |  | 661 |  | 429 |  | 1, 923 |  |
| In wholesale and manufacturing industries | 6, 656 |  | 4, 698 |  | 3, 800 |  | 15, 154 |  |
| Total | 12, 415 |  | 8, 389 |  | 7, 280 |  | 28, 084 |  |
| CRAFT EMPLOYED |  |  |  |  |  |  |  |  |
| Vessels fishing | 721 |  | 103 |  | 11 |  | 835 |  |
| Boats fishing | 1, 988 |  | 1, 747 |  | 1, 350 |  | 5, 085 |  |
| Vessels transporting | 191 |  | 130 |  | 80 |  | 401 |  |
| Scows, houseboats, pile drivers, etc | 287 |  | 257 |  | 174 |  | 718 |  |
| Total | 3, 187 |  | 2, 237 |  | 1, 615 |  | 7, 039 |  |
| CATCH | *Pounds* |  | *Pounds* |  | *Pounds* |  | *Pounds* |  |
| Fish: |  |  |  |  |  |  |  |  |
| Salmon | 227, 791, 885 | $3, 529, 611 | 177, 194, 778 | $2, 692, 033 | 184, 718, 962 | $3, 721, 446 | 589, 705, 625 | $9, 943, 090 |
| Other | 65, 462, 581 | 1, 255, 804 | 134, 421, 844 | 672, 934 | 1, 832, 725 | 9, 164 | 201, 717, 150 | 1, 937, 902 |
| Shellfish | 1, 070, 300 | 58, 594 | 1, 454, 516 | 100, 401 | 840 | 35 | 2, 525, 656 | 159, 030 |
| Total | 294, 324, 766 | 4, 844, 009 | 313, 071, 138 | 3, 465, 368 | 186, 552, 527 | 3, 730, 645 | 793, 948, 431 | 12, 040, 022 |
|  | *Number* | *Value* | *Number* | *Value* | *Number* | *Value* | *Number* | *Value* |
| Whales |  |  |  |  | 173 |  | 173 |  |
| WHOLESALE AND MANUFACTURING |  |  |  |  |  |  |  |  |
| Establishments | 95 |  | 97 |  | 38 |  | 230 |  |
| PRODUCTS AS PREPARED FOR MARKET | *Pounds* |  | *Pounds* |  | *Pounds* |  | *Pounds* |  |
| Salmon | 150, 657, 374 | 13, 841, 611 | 105, 332, 345 | 10, 556, 993 | 93, 866, 265 | 14, 593, 909 | 349, 855, 984 | 38, 992, 513 |
| Herring | 20, 178, 820 | 460, 842 | 53, 974, 156 | 1, 547, 601 | 900, 500 | 44, 641 | 75, 053, 476 | 2, 053, 084 |
| Halibut | 13, 930, 142 | 980, 880 |  |  |  |  | 13, 930, 142 | 980, 880 |
| Cod |  |  | 141, 845 | 7, 668 | 146, 696 | 8, 513 | 288, 541 | 16, 181 |
| Trout | 68, 257 | 6, 004 | 10, 475 | 887 |  |  | 78, 732 | 6, 891 |
| Sablefish | 909, 234 | 38, 882 |  |  |  |  | 909, 234 | 38, 882 |
| Flounders | 232, 145 | 7, 050 |  |  |  |  | 232, 145 | 7, 050 |
| Rockfishes | 4, 376 | 90 |  |  |  |  | 4, 376 | 90 |
| "Lingcod" | 2, 154 | 628 |  |  |  |  | 2, 154 | 628 |
| Clams | 122, 580 | 59, 290 | 392, 394 | 193, 309 | 420 | 175 | 515, 394 | 252, 774 |
| Shrimp | 428, 101 | 165, 388 | 7, 700 | 3, 086 |  |  | 435, 801 | 168, 474 |
| Crabs | 147, 582 | 50, 391 | 335, 694 | 122, 247 |  |  | 483, 276 | 172, 638 |
| Whale |  |  |  |  | 4, 874, 250 | 179, 641 | 4, 874, 250 | 179, 641 |
| Total | 186, 680, 765 | 15, 611, 056 | 160, 194, 609 | 12, 431, 791 | 99, 788, 131 | 14, 826, 879 | 446, 663, 505 | 42, 869, 726 |

## *Fisheries of Alaska, 1938*—Continued

### OPERATING UNITS: BY DISTRICTS

| Item | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* |
| Fishermen | 4,926 | 3,030 | 3,051 | 11,007 |
| Vessels fishing: | | | | |
| Steam | | | 5 | 5 |
| Net tonnage | | | 417 | 417 |
| Motor | 721 | 103 | 6 | 830 |
| Net tonnage | 8,602 | 2,520 | 242 | 11,364 |
| Boats fishing: | | | | |
| Motor | 854 | 769 | 59 | 1,682 |
| Other | 1,134 | 978 | 1,291 | 3,403 |
| Apparatus: | | | | |
| Traps | 286 | 170 | | 456 |
| Purse seines | 458 | 257 | 7 | 722 |
| Yards | 155,504 | 61,510 | 3,000 | 220,014 |
| Haul seines | 26 | 129 | | 155 |
| Yards | 3,760 | 25,078 | | 28,838 |
| Gill nets | 427 | 2,074 | 2,218 | 4,719 |
| Yards | 56,450 | 257,570 | 342,378 | 656,398 |
| Apparatus—Continued. | | | | |
| Beam trawls | 6 | 1 | | 7 |
| Otter trawls | | | 1 | 1 |
| Wheels | | | 241 | 241 |
| Lines: | | | | |
| Hand lines (cod fishery) | | 9 | 15 | 24 |
| Trawl lines (cod fishery) | | 6 | 1 | 7 |
| Troll lines (salmon fishery) | 3,718 | 4 | | 3,722 |
| Skates of lines (halibut fishery) | 3,422 | | | 3,422 |
| Crab pots | 639 | 1,554 | | 2,193 |
| Crab nets | | 100 | | 100 |
| Yards | | 3,000 | | 3,000 |
| Herring pounds | 9 | | | 9 |
| Herring pound seines | 6 | | | 6 |

### CATCH: BY DISTRICTS

[Estimated round weight and value to fishermen]

| Item | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| FISH | | | | | | | | |
| Salmon: | | | | | | | | |
| Blueback, red, or sockeye | 17,747,919 | $420,071 | 45,442,929 | $977,885 | 171,012,264 | $3,629,284 | 234,203,112 | $5,027,240 |
| Chinook or king | 15,142,340 | 405,127 | 1,634,240 | 41,686 | 1,777,220 | 18,916 | 18,553,800 | 465,729 |
| Chum, or keta | 41,007,546 | 447,907 | 23,894,937 | 234,017 | 11,867,454 | 72,625 | 76,769,937 | 754,549 |
| Humpback or pink | 136,297,080 | 1,881,842 | 99,631,608 | 1,311,549 | 7,744 | 67 | 235,936,432 | 3,193,458 |
| Silver or coho | 17,597,000 | 374,664 | 6,591,064 | 126,896 | 54,280 | 554 | 24,242,344 | 502,114 |
| Herring | 44,453,969 | 222,270 | 133,937,333 | 669,687 | 1,344,030 | 6,720 | 179,735,332 | 898,677 |
| Halibut | 19,366,221 | 980,880 | | | | | 19,366,221 | 980,880 |
| Cod | | | 471,417 | 2,360 | 488,695 | 2,444 | 960,112 | 4,804 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Trout: | | | | | | | | |
| Dolly Varden | 77, 560 | 5, 751 | 13, 094 | 887 | | | 90, 654 | 6, 638 |
| Steelhead | 7, 761 | 253 | | | | | 7, 761 | 253 |
| Sablefish | 1, 289, 981 | 38, 882 | | | | | 1, 289, 984 | 38, 882 |
| Flounders | 257, 939 | 7, 050 | | | | | 257, 939 | 7, 050 |
| Rockfishes | 6, 732 | 90 | | | | | 6, 732 | 90 |
| "Lingcod" | 2, 415 | 628 | | | | | 2, 415 | 628 |
| Total | 293, 254, 466 | 4, 785, 415 | 311, 616, 622 | 3, 364, 967 | 186, 551, 687 | 3, 730, 610 | 791, 422, 775 | 11, 880, 992 |
| SHELLFISH | | | | | | | | |
| Crabs: | | | | | | | | |
| Dungeness | 276, 419 | 24, 971 | 609, 984 | 56, 475 | | | 886, 403 | 81, 446 |
| King | 2, 880 | 225 | 45, 744 | 4, 648 | | | 48, 624 | 4, 873 |
| Shrimp | 777, 801 | 33, 078 | 14, 000 | 617 | | | 791, 801 | 33, 695 |
| Clams: | | | | | | | | |
| Butter | 13, 200 | 320 | 1, 056 | 36 | | | 14, 256 | 356 |
| Razor | (1) | (1) | 783, 732 | 38, 625 | 840 | 35 | 784, 572 | 38, 660 |
| Total | 1, 070, 300 | 58, 594 | 1, 454, 516 | 100, 401 | 840 | 35 | 2, 525, 656 | 159, 030 |
| Grand total | 294, 324, 766 | 4, 844, 009 | 313, 071, 138 | 3, 465, 368 | 186, 552, 527 | 3, 730, 645 | 793, 948, 431 | 12, 040, 022 |

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[1] Razor clams packed in Southeast Alaska were not taken in the Territory but were obtained from beaches at Massett, B. C. They are therefore not included in the catch statistics.

NOTE.—In addition to the above statistics, 173 whales were taken in Alaska waters. The round weight and value to fishermen cannot be determined, but the products amounted to 4,874,250 pounds, valued at $179,641.

## *Industries related to the fisheries of Alaska, 1938*

### TRANSPORTING

| Item | Southeast Alaska | Central Alaska | Western Alaska | Total | Item | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | | *Number* | *Number* | *Number* | *Number* |
| Persons engaged | 833 | 661 | 429 | 1, 923 | Vessels transporting—Continued. | | | | |
| Vessels transporting: | | | | | Motor | 191 | 130 | 75 | 396 |
| Steam | | | 5 | 5 | Net tonnage | 5, 927 | 4, 168 | 3, 894 | 13, 989 |
| Net tonnage | | | 18, 608 | 18, 608 | Scows, houseboats, pile drivers, etc. | 287 | 257 | 174 | 718 |

## *Industries related to the fisheries of Alaska, 1938*—Continued

### WHOLESALE AND MANUFACTURING

| Item | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* |
| Persons engaged | 6,656 | 4,698 | 3,800 | 15,154 |
| Establishments: | | | | |
| Handling fresh and frozen fish | 52 | 5 | | 57 |
| Curing fish | 22 | 43 | 22 | 87 |
| Canning fish | 45 | 53 | 18 | 116 |
| Manufacturing byproducts | 6 | 10 | 1 | 17 |
| Total (exclusive of duplication) | 95 | 97 | 38 | 230 |

### PRODUCTS AS PREPARED FOR MARKET

| Item | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| FRESH | | | | | | | | |
| Salmon (for food) | 3,817,042 | $291,335 | | | | | 3,817,042 | $291,335 |
| Herring (for bait) | 2,826,404 | 37,865 | 1,250 | $13 | | | 2,827,654 | 37,878 |
| Halibut | 6,794,439 | 429,448 | | | | | 6,794,439 | 429,448 |
| Halibut livers | 133,000 | 66,500 | | | | | 133,000 | 66,500 |
| Halibut and sablefish viscera | 240,787 | 24,079 | | | | | 240,787 | 24,079 |
| Trout | 50,962 | 4,534 | 1,500 | 195 | | | 52,462 | 4,729 |
| Sablefish livers | 32,045 | 11,216 | | | | | 32,045 | 11,216 |
| Flounders | 150,000 | 3,750 | | | | | 150,000 | 3,750 |
| "Lingcod" | 610 | 10 | | | | | 610 | 10 |
| "Lingcod" and rockfish livers | 1,544 | 618 | | | | | 1,544 | 618 |
| Crabs: | | | | | | | | |
| Meat | 2,765 | 1,134 | 225 | 90 | | | 2,990 | 1,224 |
| Whole in shell | 15,865 | 990 | 15,660 | 944 | | | 31,525 | 1,934 |
| Shrimp: | | | | | | | | |
| Meat | 424,200 | 164,000 | 7,700 | 3,086 | | | 431,900 | 167,086 |
| Whole in shell | 690 | 104 | | | | | 690 | 104 |
| Total | 14,490,353 | 1,035,583 | 26,335 | 4,328 | | | 14,516,688 | 1,039,911 |
| FROZEN | | | | | | | | |
| Salmon (for food) | 7,183,446 | 530,891 | 1,600 | 60 | | | 7,185,046 | 530,951 |
| Salmon (for bait) | 720,652 | 7,241 | | | | | 720,652 | 7,241 |
| Salmon (for fur farms) | 61,420 | 2,500 | | | | | 61,420 | 2,500 |
| Herring (for bait) | 3,316,114 | 23,924 | | | | | 3,316,114 | 23,924 |
| Halibut | 6,761,916 | 460,853 | | | | | 6,761,916 | 460,853 |
| Trout | 17,295 | 1,470 | 8,975 | 692 | | | 26,270 | 2,162 |
| Sablefish | 776,825 | 23,499 | | | | | 776,825 | 23,499 |
| Rockfishes | 4,376 | 90 | | | | | 4,376 | 90 |
| Flounders (for fur farms) | 82,145 | 3,300 | | | | | 82,145 | 3,300 |
| Shrimp | 3,211 | 1,284 | | | | | 3,211 | 1,284 |
| Total | 18,927,400 | 1,055,052 | 10,575 | 752 | | | 18,937,975 | 1,055,804 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CURED | | | | | | | | |
| Salmon: | | | | | | | | |
| Mild-cured | 6, 344, 000 | 1, 257, 247 | 16, 800 | 1, 600 | 158, 400 | $20, 084 | 6, 519, 200 | 1, 278, 931 |
| Pickled | 9, 600 | 900 | 313, 200 | 31, 228 | 854, 885 | 90, 293 | 1, 177, 685 | 122, 421 |
| Dry-salted | 10, 500 | 1, 132 | 18, 000 | 500 | 17, 300 | 1, 730 | 45, 800 | 3, 362 |
| Dried | | | 4, 025 | 140 | 998, 000 | 71, 200 | 1, 002, 025 | 71, 340 |
| Eggs for fish food | 7, 300 | 365 | | | | | 7, 300 | 365 |
| Herring: | | | | | | | | |
| Pickled (for food): | | | | | | | | |
| Scotch-cure | | | 1, 634, 000 | 97, 927 | 552, 150 | 32, 497 | 2, 186, 150 | 130, 424 |
| Norwegian-cure | | | | | 192, 800 | 5, 784 | 192, 800 | 5, 784 |
| Roused | | | 261, 350 | 6, 395 | 155, 550 | 6, 360 | 416, 900 | 12, 755 |
| Cod: | | | | | | | | |
| Dry-salted | | | 135, 119 | 6, 797 | 146, 019 | 8, 421 | 281, 138 | 15, 218 |
| Stockfish | | | 6, 126 | 796 | 552 | 82 | 6, 678 | 878 |
| Tongues | | | 600 | 75 | 125 | 10 | 725 | 85 |
| Sablefish, pickled | 100, 364 | 4, 167 | | | | | 100, 364 | 4, 167 |
| Total | 6, 471, 764 | 1, 263, 811 | 2, 389, 220 | 145, 458 | 3, 075, 781 | 236, 461 | 11, 936, 765 | 1, 645, 730 |
| CANNED | | | | | | | | |
| Salmon: | | | | | | | | |
| Blueback, red, or sockeye | 9, 244, 368 | $1, 626, 428 | 23, 127, 120 | $3, 812, 593 | 88, 647, 696 | $14, 144, 776 | 121, 019, 184 | $19, 583, 797 |
| Chinook or king | 785, 760 | 118, 673 | 1, 005, 312 | 162, 252 | 311, 952 | 47, 718 | 2, 103, 024 | 328, 643 |
| Chum or keta | 22, 773, 744 | 1, 710, 785 | 12, 128, 928 | 916, 467 | 2, 861, 472 | 216, 171 | 37, 764, 144 | 2, 843, 423 |
| Humpback or pink | 90, 564, 912 | 7, 345, 054 | 64, 613, 232 | 5, 136, 669 | | | 155, 178, 144 | 12, 481, 723 |
| Silver or coho | 6, 900, 720 | 910, 863 | 3, 754, 128 | 486, 511 | 16, 560 | 1, 937 | 10, 671, 408 | 1, 399, 311 |
| Clams | 121, 380 | 59, 190 | 392, 394 | 193, 309 | 420 | 175 | 514, 194 | 252, 674 |
| Clam juice | 1, 200 | 100 | | | | | 1, 200 | 100 |
| Crabs | 128, 952 | 48, 267 | 319, 809 | 121, 213 | | | 448, 761 | 169, 480 |
| Total | 130, 521, 036 | 11, 819, 360 | 105, 340, 923 | 10, 829, 014 | 91, 838, 100 | 14, 410, 777 | 327, 700, 059 | 37, 059, 151 |
| BYPRODUCTS | | | | | | | | |
| Meal: | | | | | | | | |
| Herring | 7, 279, 394 | 132, 032 | 24, 911, 116 | 417, 582 | | | 32, 190, 510 | 549, 614 |
| Salmon | 1, 832, 000 | 27, 480 | 242, 000 | 3, 933 | | | 2, 074, 000 | 31, 413 |
| Whale: | | | | | | | | |
| Meat meal | | | | | 792, 000 | 15, 796 | 792, 000 | 15, 796 |
| Bone meal | | | | | 432, 000 | 5, 618 | 432, 000 | 5, 618 |
| Oil: | | | | | | | | |
| Salmon | 401, 910 | 10, 717 | 180, 000 | 5, 040 | | | 509, 910 | 15, 757 |
| Herring | 6, 756, 908 | 267, 021 | 27, 166, 440 | 1, 025, 684 | | | 33, 923, 348 | 1, 292, 705 |
| Whale | | | | | 2, 286, 000 | 103, 657 | 2, 286, 000 | 103, 657 |
| Sperm | | | | | 1, 364, 250 | 54, 570 | 1, 364, 250 | 54, 570 |
| Total | 16, 270, 212 | 437, 250 | 52, 427, 556 | 1, 452, 239 | 4, 874, 250 | 179, 641 | 73, 572, 018 | 2, 069, 130 |
| Grand total | 186, 680, 765 | 15, 611, 056 | 160, 194, 609 | 12, 431, 791 | 99, 788, 131 | 14, 826, 879 | 446, 663, 505 | 42, 869, 726 |

NOTE.—The output of fresh and frozen halibut includes all fares of the Alaska fleet, some of which were landed at other than Alaska ports. The amount of livers and viscera landed by the Alaska fleet has not been reported, and the quantity shown herein is the estimated amount landed in Alaska. The total landings of halibut, other than livers and viscera, in Alaska in 1938 amounted to 8,296,907 pounds, valued at $499,472 (including 26,000 pounds, valued at $2,000, landed by Canadian vessels).

The output of clams in Southeast Alaska includes 115,380 pounds, valued at $57,690, which were packed from clams obtained at Massett, B. C.

*Supplementary table showing the pack of canned products in "standard cases"* [1]

| Item | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| Salmon: | | | | | | | | |
| Blueback, red, or sockeye | 192, 591 | $1, 626, 428 | 481, 815 | $3, 812, 593 | 1, 846, 827 | $14, 144, 776 | 2, 521, 233 | $19, 583, 797 |
| Chinook or king | 16, 370 | 118, 673 | 20, 944 | 162, 252 | 6, 499 | 47, 718 | 43, 813 | 328, 643 |
| Chum or keta | 474, 453 | 1, 710, 785 | 252, 686 | 916, 467 | 59, 614 | 216, 171 | 786, 753 | 2, 843, 423 |
| Humpback or pink | 1, 886, 769 | 7, 345, 054 | 1, 346, 109 | 5, 136, 669 | | | 3, 232, 878 | 12, 481, 723 |
| Silver or coho | 143, 765 | 910, 863 | 78, 211 | 486, 511 | 345 | 1, 937 | 222, 321 | 1, 399, 311 |
| Total | 2, 713, 948 | 11, 711, 803 | 2, 179, 765 | 10, 514, 492 | 1, 913, 285 | 14, 410, 602 | 6, 806, 998 | 36, 636, 897 |
| Clams | [2] 8, 092 | 59, 190 | 26, 160 | 193, 309 | 28 | 175 | 34, 280 | 252, 674 |
| Clam juice | 40 | 100 | | | | | 40 | 100 |
| Crabs | 2, 686 | 48, 267 | 6, 663 | 121, 213 | | | 9, 349 | 169, 480 |
| Grand total | 2, 724, 766 | 11, 819, 360 | 2, 212, 588 | 10, 829, 014 | 1, 913, 313 | 14, 410, 777 | 6, 850, 667 | 37, 059, 151 |

[1] The pack of salmon and crabs has been converted to "standard cases" of 48 1-pound cans, and clams and clam juice to "standard cases" of 48 No. 1 cans.

[2] Of this number, 7,692 cases, valued at $57,690, were packed from clams obtained at Massett, B. C.

*Supplementary table showing the output of byproducts in tons and gallons*

| Item | | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|---|
| | | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Meal: | | | | | | | | | |
| Herring | tons | 3, 640 | $132, 032 | 12, 455 | $417, 582 | | | 16, 095 | $549, 614 |
| Salmon | do | 916 | 27, 480 | 121 | 3, 933 | | | 1, 037 | 31, 413 |
| Whale: | | | | | | | | | |
| Meat meal | do | | | | | 396 | $15, 796 | 396 | 15, 796 |
| Bone meal | do | | | | | 216 | 5, 618 | 216 | 5, 618 |
| Oil: | | | | | | | | | |
| Salmon | gallons | 53, 588 | 10, 717 | 14, 400 | 5, 040 | | | 67, 988 | 15, 757 |
| Herring | do | 900, 921 | 267, 021 | 3, 622, 192 | 1, 025, 684 | | | 4, 523, 113 | 1, 292, 705 |
| Whale | do | | | | | 304, 800 | 103, 657 | 304, 800 | 103, 657 |
| Sperm | do | | | | | 181, 900 | 54, 570 | 181, 900 | 54, 570 |
| Total | | | 437, 250 | | 1, 452, 239 | | 179, 641 | | 2, 069, 130 |

## WHALING [15]

A total of 2,196 whales were processed by United States firms during the 1938–39 whaling season. Of these, 173 were taken off Alaska during the months from June to October 1938; 917 were captured off West Australia during the same period; and 1,106 were taken in the Antarctic during the months from December 1938 to March 1939. Four companies were licensed by the United States to engage in whaling during the 1938–39 season; however, only three operated. These consisted of one shore station in Alaska and two factory ships, one of which operated off West Australia and the other in the Antarctic. A scarcity of whales, fewer operating units, and more stringent restrictions governing whaling contributed to a decreased catch during the 1938–39 season as compared with that of the previous year when 5,198 whales were processed.

Prior to December 20, 1938, under the joint regulations of the Secretary of the Treasury and the Secretary of Commerce, there was a 35-foot limit on humpback whales, a 50-foot limit on finback whales, and a 60-foot limit on blue whales. However, whaling regulations approved December 20, 1938, pursuant to the June 8, 1937, London Agreement, increased the size limit on blue whales to 70 feet, finback whales to 55 feet, and established a 35-foot limit on sperm whales. Only whaling in the Antarctic was affected by the new regulations, as the season had closed in Australia and Alaska before the adoption of these measures.

On June 24, 1938, representatives of several nations, including those of the United States, meeting in London, agreed to a Protocol to the Agreement of June 8, 1937. This Protocol, proclaimed by the President April 8, 1939, afforded further protection to whales, and at the same time permitted smaller size limits on blue, sperm, and finback whales processed at land stations, the products of which were to be used for local animal or human consumption.

*Whaling, 1938–39 Season* [1]

OPERATING UNITS: BY AREAS

| Area | Shore stations | | Factory ships | | Killer boats | | Total persons employed |
|---|---|---|---|---|---|---|---|
| | Number | Persons employed | Number | Crew | Number | Crew | |
| Alaska | 1 | 78 | | | 5 | 58 | 136 |
| Antarctic | | | 1 | 214 | 8 | 106 | 320 |
| West Australia | | | 1 | 116 | 6 | 78 | 194 |
| Total | 2 | 78 | 2 | 330 | 19 | 242 | 650 |

[1] Includes the operations of shore stations, factory ships, and killer boats licensed by the United States.

NOTE.—One firm in California obtained a license in 1938, but did not operate.

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[15] This section was prepared by Esther E. Dodd, Law Enforcement Division. Additional information concerning the 1938–39 whaling season can be obtained from Bureau of Fisheries Memorandum entitled, "A History of Whaling with Résumé of the Whaling Industry of the United States, 1937–40."

*Whaling, 1938-39 Seasons*—Continued

CATCH: BY SPECIES AND AREAS

| Area | Blue | Hump-back | Sperm | Finback | Total |
|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* |
| Alaska | 33 | 12 | 63 | 65 | 173 |
| West Australia | | 917 | | | 917 |
| Antarctic | 554 | | 4 | 548 | 1,106 |
| Total | 587 | 929 | 67 | 613 | 2,196 |

NOTE.—In addition to the above catch, 8 whales were harpooned but not recovered.

PRODUCTS MANUFACTURED: BY AREAS

| Area | Oil | | Meal | |
|---|---|---|---|---|
| | Body | Sperm | Meat | Bone |
| | *Gallons* | *Gallons* | *Tons* | *Tons* |
| Alaska | 304,800 | 181,900 | 396 | 216 |
| West Australia | 2,096,579 | | | |
| Antarctic | 4,574,141 | | | |
| Total | 6,975,520 | 181,900 | 396 | 216 |

## STATISTICAL SURVEY PROCEDURE

It is customary to include in the annual report of the Division, information in considerable detail on the procedure used in the collection of the fishery statistics published in this report. Due to the necessity for curtailing the cost of the report for 1939, it has been necessary to eliminate most of this type of material. Consequently, for information on procedure the reader is referred to Administrative Report No. 37, entitled "Fishery Industries of the United States, 1938," by R. H. Fiedler, published as Appendix III to the report of the Commissioner of Fisheries for the fiscal year 1939. It has been deemed necessary, however, to include in this report data on conversion factors used for computing the yield of certain commodities. These factors follow:

*Measures and yields of oysters*

| State | Capacity of State bushel | Variation from U. S. standard bushel | | Market oysters | |
|---|---|---|---|---|---|
| | | | | Yield per State bushel | Yield per standard bushel |
| | *Cubic inches* | *Cubic inches* | *Percent* | *Pounds of meats* | *Pounds of meats* |
| Massachusetts | 2,150.4 | | | 6.57 | 6.57 |
| Rhode Island | 2,150.4 | | | 7.00 | 7.00 |
| Connecticut | 2,150.4 | | | 7.63 | 7.63 |
| New York | 2,150.4 | | | 7.50 | 7.50 |
| New Jersey | 2,257.3 | +106.9 | +5.0 | 6.05 | 5.76 |
| Delaware | 2,257.3 | +106.9 | +5.0 | 7.00 | 6.67 |
| Maryland | 2,801.5 | +651.1 | +30.3 | 6.09 | 4.67 |
| Virginia | 3,003.4 | +853.0 | +39.7 | 5.92 | 4.24 |
| North Carolina | 2,801.9 | +651.5 | +30.3 | 5.56 | 4.27 |
| South Carolina | 4,071.5 | +1,921.1 | +89.3 | 5.98 | 3.16 |
| Georgia | 5,343.9 | +3,193.5 | +148.5 | 6.83 | 2.75 |
| Florida | 3,214.1 | +1,063.7 | +49.4 | 4.74 | 3.17 |
| Alabama | 2,826.2 | +675.8 | +31.4 | 5.01 | 3.81 |
| Mississippi | 2,826.2 | +675.8 | +31.4 | 5.30 | 4.03 |
| Louisiana | 2,148.4 | −2.0 | −0.1 | 4.63 | 4.63 |
| Texas | 2,700.0 | +549.6 | +25.6 | 4.38 | 3.49 |

*Other mollusks.*—The following table shows the conversion factors for various mollusks, other than oysters, used in this report.

*Average yields of certain mollusks in pounds of meats per standard bushel* [1]

| State | Clams, hard | Clams, soft | Clams, surf | Clams, razor | Mussels, sea | Periwinkles and cockles | Scallops, bay | Scallops, sea | Limpets | Conchs |
|---|---|---|---|---|---|---|---|---|---|---|
| Maine | 11.00 | 15.00 | -------- | ---- | 12.00 | 18.00 | ------ | 6.00 | -------- | -------- |
| New Hampshire | ------- | 15.00 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Massachusetts | 11.13 | 13.93 | 17.00 | 30.08 | 12.00 | 18.00 | 6.00 | 6.00 | -------- | -------- |
| Rhode Island | 15.81 | 20.00 | 12.00 | -------- | 13.00 | 18.00 | 7.00 | 7.00 | 13.00 | -------- |
| Connecticut | 12.04 | 20.00 | -------- | -------- |  | -------- | 6.50 | ------ | -------- | 19.75 |
| New York | 8.00 | 16.00 | 12.00 | -------- | 10.00 | -------- | 5.00 | 6.00 | -------- | 18.00 |
| New Jersey | 9.49 | 19.04 | 16.83 | -------- | -------- | -------- | -------- | 4.29 | -------- | -------- |
| Delaware | 9.52 | -------- | -------- | -------- | 11.43 | -------- | -------- | -------- | -------- | -------- |
| Maryland | 6.14 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- |
| Virginia | 5.73 | 7.16 | -------- | -------- | 7.16 | -------- | -------- | -------- | -------- | -------- |
| North Carolina | 6.14 | -------- | -------- | -------- | -------- | -------- | 6.14 | -------- | -------- | -------- |
| Florida | 5.04 | -------- | -------- | -------- | -------- | -------- | 2.99 | -------- | -------- | -------- |

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[1] Prior to 1928 data on the yields of meats were computed on the basis of State bushels of the size prescribed by the individual States, rather than on the basis of the U. S. standard bushel of 2,150.4 cubic inches capacity.

*Other conversion factors.*—The principal other conversion factors that have been used in this report are as follws:

Crustaceans:

| | |
|---|---|
| Crabs, soft and peelers (Connecticut Rhode Island, New Jersey, New York, Delaware, Maryland, and Virginia). | To convert number of crabs to weight in pounds, divided by 4. |
| Crabs, soft and peelers (North Carolina and South Carolina). | To convert number of crabs to weight in pounds, divide by 7. |
| Crabs, soft and peelers (Louisiana) | To convert number of crabs to weight in pounds, divide by 2.71. |
| Crabs, hard (Maine) | To convert number of crabs to weight in pounds, divide by 3.32. |
| Crabs, hard (Massachusetts) | To convert number of crabs to weight in pounds, divide by 3.97. |
| Crabs, hard (Connecticut) | To convert number of crabs to weight in pounds, divide by 2.88. |
| Crabs, hard (South Carolina) | To convert number of crabs to weight in pounds, divide by 2. |
| Crabs, hard (Florida) | To convert number of crabs to weight in pounds, divide by 2.07. |
| Crabs, hard (Alabama and Georgia) | To convert number of crabs to weight in pounds, divide by 2.4. |
| Crabs, hard (Mississippi) | To convert number of crabs to weight in pounds, divide by 2.09. |
| Crabs, hard (Louisiana) | To convert number of crabs to weight in pounds, divide by 2.12. |
| Crabs, hard (Texas) | To convert number of crabs to weight in pounds, divide by 2.10. |
| Crabs, hard (other Atlantic Coast States). | To convert number of crabs to weight in pounds, divide by 3. |
| Crabs, rock | To convert number of crabs to weight in pounds, divide by 10. |
| Crabs, stone | To convert number of crabs to weight in pounds, multiply by 1.06. |

Sponges, dried (Florida):

| | |
|---|---|
| Large wool | To convert number of bunches to weight in pounds, multiply by 10. |
| Medium and small wool | To convert number of bunches to weight in pounds, multiply by 5. |
| Wool rags | To convert number of bunches to weight in pounds, multiply by 4.73. |
| Grass | To convert number of bunches to weight in pounds, multiply by 1.5. |
| Wire and yellow | To convert number of bunches to weight in pounds, multiply by 1.95. |

## COMMON AND SCIENTIFIC NAMES OF FISHERY PRODUCTS

In order to prevent misunderstanding in the use of common names employed in the tables and discussions, the following list of common and scientific names is given:

*Common and scientific names of the commercial fishery products caught in the United States and Alaska*

| Common name as shown in Bureau reports | Other common names | Scientific names |
|---|---|---|
| Alewife | Branch herring, wall-eyed or big-eyed herring. | *Pomolobus pseudoharengus.* |
| | Blueback, glut herring | *Pomolobus æstivalis.* |
| Amberjack | | *Seriola* species. |
| Anchovy | | *Engraulis mordax.*<br>*Anchoviella delicatissima.*<br>*Anchoviella compressa.* |
| Angelfish | | *Pomacanthus arcuatus.*<br>*Holacanthus isabelita.* |
| Barracuda | | *Sphyraena argentea.* |
| Black bass | Smallmouth bass | *Micropterus dolomieu.* |
| | Largemouth bass | *Micropterus salmiodes.* |
| Bluefish | Tailor | *Pomatomus saltatrix.* |
| Blue pike | Pike perch, blue pickerel (Canada) | *Stizostedion vitreum glaucum.* |
| Blue runner or hardtail | Runner | *Caranx crysos.* |
| Bonito | | *Sarda sarda.*<br>*Sarda chiliensis.* |
| Bowfin | | *Amia calva.* |
| Buffalofish | | *Ictiobus* species. |
| Butterfish | | *Poronotus triacanthus.* |
| Burbot | Lawyer, ling | *Lota maculosa.* |
| Cabio | Coalfish, crab eater, cobia | *Rachycentron canadus.* |
| Cabrilla | Rock bass | *Epinephelus analogus* (Pacific coast). |
| Carp | German carp | *Cyprinus carpio.* |
| Catfish and bullheads | | *Ameiurus* species.<br>*Ictalurus* species.<br>*Leptops olivaris.* |
| Cero | Painted mackerel | *Scomberomorus regalis.* |
| Chub | Tullibee in Canada; longjaw, bluefin, blackfin in United States. | All *Leuchichthys* except *artedi* (in Great Lakes). |
| Cigarfish | Scad | *Decapterus punctatus.* |
| Cisco | Herring in Canada | *Leucichthys artedi* (Lake Erie only). |
| Cod | Codfish | *Gadus macrocephalus* (Pacific coast).<br>*Gadus callarias* (Atlantic coast). |
| Crappie | White crappie | *Pomoxis annularis.* |
| | Black crappie, strawberry bass, calico bass. | *Pomoxis sparoides.* |
| Crevalle | | *Caranx hippos.* |
| Croaker | Crocus, hardhead | *Micropogon undulatus.* |
| Cunner | Chogset, blue perch, bergall | *Tautogolabrus adspersus.* |
| Cusk | | *Brosme brosme.* |
| Dolly Varden trout | Salmon trout, bull trout | *Salvelinus malma.* |
| Dolphin | | *Coryphaena hippurus.* |
| Drum: | | |
| Black | | *Pogonias cromis.* |
| Red | Channel bass, redfish, spotted bass | *Sciaenops ocellatus.* |
| Eel: | | |
| Common | | *Anguilla rostrata.* |
| Conger | | *Leptocephalus conger.* |

*Common and scientific names of the commercial fishery products caught in the United States and Alaska*—Continued

| Common name as shown in Bureau reports | Other common names | Scientific names |
|---|---|---|
| Flounder: | | |
| Gray sole | | *Glyptocephalus cynoglossus.* |
| Lemon sole | | *Pseudopleuronectes dignabilis.* |
| Yellowtail and dab | | *Limanda ferruginea.*<br>*Hippoglossoides platessoides.* |
| Blackback | | *Pseudopleuronectes americanus.* |
| Fluke | | *Paralichthys dentatus.* |
| "Sole" | | *Pleuronectidae* species (Pacific coast). |
| California halibut | | *Paralichthys californicus.* |
| Unclassified | | *Pleuronectidae* species. |
| Flyingfish | | *Cypsilurus californicus.* |
| Frigate mackerel | "Boo Hoo" | *Auxis thazard.* |
| Garfish | | *Tylosurus* species. |
| Gizzard shad | Nanny shad, mud shad | *Dorosoma cepedianum.* |
| Goldfish | Sand perch | *Carassius auratus.* |
| Goosefish | Allmouth | *Lophius piscatorius.* |
| Grayfish | Dogfish | *Squalus sucklii* (Pacific coast). |
| | Spiny dog | *Squalus acanthias.* |
| | Smooth dog | *Mustelus mustelus.* |
| Grouper | "Sea bass" | *Ephinephelus* species.<br>*Myceteroperca* species. |
| Grunt | Margatefish, sailors choice (Key West) | *Haemulon* species. |
| Haddock | | *Melanogrammus aeglefinus.* |
| Hake | Squirrel hake, Boston hake, ling, black hake, mud hake. | *Urophycis* species (Atlantic coast). |
| | Merluccio | *Merluccius productus* (Pacific coast). |
| Halibut | | *Hippoglossus hippoglossus.* |
| Hardhead | | *Orthodon microlepidotus* (Pacific coast). |
| Harvestfish | Starfish, dollarfish, pappyfish, butterfish (N. C.). | *Peprilus alepidotus.* |
| Herring: | | |
| Lake | Herring | *Leucichthys artedi* (Great Lakes, except Erie). |
| Round | | *Etrumeus sadina.* |
| Sea | | *Clupea harengus* (Atlantic coast).<br>*Clupea pallasii* (Pacific coast). |
| Herring smelt | Sea smelt | *Argentina silus.* |
| Hickory shad | Tailor shad, skip | *Pomolobus mediocris.* |
| Hogchoker | | *Achirus fasciatus.* |
| Hogfish | Capitaine, perro perro | *Lachnolaimus maximus* (Florida). |
| Horse mackerel | Pacific | *Trachurus symmetricus.* |
| | Atlantic—(See tuna.) | |
| Jewfish | | *Promicrops itaiara.* |
| Kingfish | King mackerel, cerro | *Scomberomorus cavalla* (Atlantic coast).<br>*Scomberomorus regalis* (Atlantic coast). |
| | Little roncador, croaker | *Genyonemus lineatus* (California). |
| King whiting | Northern whiting, kingfish, sea mink | *Menticirrhus* species. |
| Lake trout | | *Cristivomer mamaycush.* |
| Lamprey | | *Petromyzon marinus.* |
| Launce | Sand eel, lant, sand launce | *Ammodytes americanus.* |
| "Lingcod" | Cultus cod, blue cod, buffalo cod, ling | *Ophiodon elongatus.* |
| Mackerel | | *Scomber scombrus* (Atlantic coast).<br>*Scomber diego* (Pacific coast). |
| Menhaden | Mossbunker, pogy, fatback | *Brevoortia tyrannus.* |
| Minnow | | Cyprinidae species. |
| Mojarra | | Gerridae species. |
| Mooneye | Toothed herring | *Hiodon* species. |
| Moonfish | | *Vomer setipinnis.*<br>*Selene vomer.* |
| Mullet | Jumping mullet | *Mugil* species. |
| Mummichog | Mayfish, killifish | *Fundulus* species. |
| Muttonfish | | *Lutianus analis.* |
| Paddlefish | Spoonbill cat | *Polyodon spathula.* |
| Perch (California) | See surffishes. | |
| Permit | See pompano. | |
| Pigfish | Hogfish (N. C.) | *Orthopristis chrysopterus* |
| Pike or pickerel | Great Lakes pike | *Esox reticulatus.*<br>*Esox lucius.* |
| Pilchard | Sardine | *Sardina caerulea.* |
| Pinfish | Bream, salt-water bream | *Lagodon rhomboides.* |
| Pollock | | *Pollachius virens.* |
| Pompano | Permit, great pompano | *Trachinotus goodei.* |
| | | *Trachinotus* species (Atlantic coast). |
| | | *Palometa simillima* (Pacific coast). |
| Porgy | Porgee | *Calamus* species. |
| Quillback | Spearfish or skimfish | *Carpiodes* species. |
| Roach | Golden Shiner | *Notemigonus crysoleucas.* |
| Rock bass | Redeye, goggle-eye | *Ambloplites rupestris* (Mississippi River to Atlantic seaboard). |
| | Groupers | *Paralabrax nebulifer* (Pacific coast). |

*Common and scientific names of the commercial fishery products caught in the United States and Alaska*—Continued

| Common name as shown in Bureau reports | Other common names | Scientific names |
|---|---|---|
| Rockfish | Rock cod | *Sebastodes* species (Pacific coast). |
| Rosefish | | *Sebastes marinus.* |
| Rudderfish | Blue bass, greenfish | *Girella nigricans* (Pacific coast). |
| | Halfmoon | *Medialuna californiensis* (Pacific coast). |
| Sablefish | Black cod | *Anoplopoma fimbria.* |
| Salmon: | | |
| Atlantic | | *Salmo salar* (Atlantic coast). |
| Pacific: | | |
| Blueback, red or sockeye. | | *Oncorhynchus nerka.* |
| Chinook or king | Tyee, spring | *Oncorhynchus tschawytscha.* |
| Chum or keta | Dog salmon | *Oncorhynchus keta.* |
| Humpback or pink. | | *Oncorhynchus gorbuscha.* |
| Silver or coho | | *Oncorhynchus kisutch.* |
| Steelhead | (See steelhead trout.) | |
| Sand perch | | *Bairdiella chrysura.* |
| Sauger | Sand pike | *Stizostedion canadense.* |
| Sculpin | | Cottidae species. |
| Scup | Paugy or porgy, fair maid | *Stenotomus* species. |
| Sea bass | Black jewfish or black sea bass | *Stereolepis gigas* (Pacific coast). |
| | Black sea bass, blackfish | *Centropristes striatus* (Atlantic coast). |
| | White sea bass | *Cynoscion nobilis* (Pacific coast). |
| Sea catfish | Gafftopsail | *Bagre marina.* |
| Sea robin | | *Prionotus* species. |
| Shad | American shad | *Alosa sapidissima.* |
| Shark | | *Carcharodon* species; *Mustelus* species; *Carcharhinus* species; *Sphyrna* species |
| Sheepshead | | *Archosargus probatocephalus* (Atlantic coast). |
| | | *Archosargus unimaculatus* (Florida). |
| | Drum, fresh water | *Aplodinotus grunniens* (fresh water). |
| Sheepshead, California | Redfish, fathead | *Pimelometopon pulcher.* |
| Silver perch | Sand perch | *Bairdiella chrysura.* |
| Silverside | Spearing | *Menidia* species. |
| Skate | | *Raja* species. |
| Skipper | Billfish | *Scomberesox saurus.* |
| Smelt | | *Osmerus mordax* (Atlantic coast and Great Lakes). |
| | | Argentinidae species (Pacific coast). |
| | Eulachon | *Thaleichthys pacificus.* |
| Snapper: | | |
| Lane | Schoolmaster | *Lutianus apodus.* |
| Mangrove | Gray snapper | *Lutianus griseus.* |
| Red | | *Lutianus blackfordii.* |
| Snook | Robalo, sergeantfish | *Centropomus undecimalis.* |
| Spadefish | Porgy (N. C.) | *Chætodipterus faber.* |
| Spanish mackerel | | *Scomberomorus maculatus.* |
| Splittail | | *Pogonichthys macrolepidotus.* |
| Spot | Lafayette, goody | *Leiostomus xanthurus.* |
| Squawfish | Sacramento pike | *Ptychocheilus grandis.* |
| Squeteague: | | |
| Gray | Gray trout, weakfish, trout | *Cynoscion regalis.* |
| Spotted | Spotted weakfish, spotted trout | *Cynoscion nebulosus.* |
| White | Sand trout | *Cynoscion arenarius.* |
| Squirrel hake | (See hake.) | |
| Steelhead trout | Salmon trout | *Salmo gairdnerii.* |
| Striped bass | Rockfish, rock | *Roccus saxatilis.* |
| Sturgeon | | *Acipenser* species. |
| Sturgeon, shovelnose | | *Scaphirhynchus platorynchus.* |
| Sucker | Fresh-water mullet | Catostomidae species. |
| Sunfish | Bream, perch | Centrarchidae species. |
| Surffish | Perch | Embiotocidae species. |
| Swellfish | Puffer, swell toad, balloonfish, globefish. | *Spheroides maculatus.* |
| Swordfish | | *Xiphias gladius.* |
| Tautog | Blackfish, oysterfish | *Tautoga onitis.* |
| Tenpounder | Elops, big-eyed herring | *Elops saurus.* |
| Tilefish | | *Lopholatilus chamæleonticeps.* |
| Tomcod | | *Microgadus tomcod* (Atlantic coast). |
| | | *Microgadus proximus* (Pacific coast). |
| Tripletail | | *Lobotes surniamensis.* |
| Tullibee | (See chub.) | |

*Common and scientific names of the commercial fishery products caught in the United States and Alaska*—Continued

| Common name as shown in Bureau reports | Other common names | Scientific names |
|---|---|---|
| Tuna and tunalike fishes: | | |
| Albacore | Longfin tuna | *Germo alalunga.* |
| Bluefin | Tuna | *Thunnus saliens.*<br>*Thunnus thynnus.*<br>*Thunnus secundodorsalis.* |
| Bonito | | *Sarda sarda* (Atlantic coast).<br>*Sarda chiliensis* (Pacific coast). |
| Skipjack | Striped tuna | *Euthynnus pelayms.* |
| Yellowfin | | *Neothunnus macropterus.* |
| Turbot | Greenland halibut<br>American turbot, triggerfish | *Reinhardius hippoglossoides* (off New England.)<br>*Balistes carolinensis* (off Florida). |
| Wahoo | | *Acanthocybium solandri.* |
| White bass | White lake bass | *Roccus chrysops.* |
| Whitebait | Small fry of several species. | |
| Whitefish: | | |
| Common | | *Coregonus clupeiformis* (Great Lakes).<br>*Caulolatilus princeps* (Pacific coast). |
| Menominee | | *Prosopium quadrilaterale.* |
| White perch | | *Morone americana* (Atlantic coast). |
| Whiting | Silver hake | *Merluccius bilinearis.* |
| Wolffish | | *Anarhichas lupus.* |
| Yellow perch | | *Perca flavescens.* |
| Yellow pike | Wall-eyed pike, pike perch, dore | *Stizostedion vitreum vitreum.* |
| Yellowtail | | *Ocyurus chrysurus* (Atlantic coast).<br>*Seriola dorsalis* (Pacific coast). |
| Crab: | | |
| Hard | Hard-shell crab, blue crab<br>Dungeness crab<br>Rock crab, hard crab | *Callinectes sapidus.*<br>*Cancer magister* (Pacific coast).<br>*Cancer irroratus* (Atlantic coast). |
| Soft and peelers | Soft-shelled crab, blue crab | *Callinectes sapidus.* |
| King | | *Paralithodes camtschatica* (Pacific coast) |
| King or horsehoe | | *Limulus* (Atlantic coast). |
| Stone | | *Menippi mercenaria.* |
| Crawfish: | | |
| Fresh-water | Crayfish | *Cambarus* species (Atlantic coast).<br>*Astacus* species (Pacific coast). |
| Sea | Rock lobster, crayfish | *Panulirus argus* (Atlantic coast).<br>*Panulirus interruptus* (Pacific coast). |
| Lobster: | | |
| Common | | *Homarus americanus* (Atlantic coast). |
| Spiny | (See sea crawfish.) | |
| Shrimp | | *Peneus setiferus.*<br>*Peneus brasiliensis* (Atlantic and Gulf coasts).<br>*Pandalus* species (Pacific coast).<br>*Pandalopsis* species (Pacific coast).<br>*Crangon* species (Pacific coast). |
| Abalone | | *Haliotis* species. |
| Clam: | | |
| Cockle | | *Cardium corbis* (Pacific coast). |
| Hard | Butter<br>Round clam, cherrystone, quahog, little neck. | *Saxidomus nuttall.*<br>*Tirela stultorum* (Pacific coast).<br>*Venus mercenaria* (Atlantic coast).<br>*Venus mortoni* (Florida coast). |
| Pismo | | *Tivela stultorum* (Pacific coast). |
| Razor | | *Ensis* species (Atlantic coast).<br>*Siliqua patula* (Pacific coast). |
| Soft | Soft shell clam, sand clam, nannynose, maninose. | *Mya arenaria.* |
| Surf | Skimmer | *Mactra solidissimo.* |
| Limpet | | *Acmæa testitudinalis.* |
| Conch | | *Strombus* species.<br>*Busycon* species. |
| Coquina | Pompano shells | *Donax variabilis.* |
| Mussel: | | |
| Sea | | *Mytilus californianus* (Pacific coast).<br>*Mytilus edulis.* |
| Fresh-water | | *Quadrula* species.<br>*Lampsilis* species.<br>*Unio* species.<br>*Symphynota* species. |
| Octopus | | *Octopus punctatus* (Pacific coast). |
| Oyster: | | |
| Eastern | | *Ostrea virginica.* |
| Pacific (introduced) | Japanese | *Ostrea gigas.* |
| Western | Olympia | *Ostrea lurida* (Pacific coast). |
| Periwinkle | | *Littorina* species. |

*Common and scientific names of the commercial fishery products caught in the United States and Alaska*—Continued

| Common name as shown in Bureau reports | Other common names | Scientific names |
|---|---|---|
| Scallop: | | |
| Bay | | *Pecten irradians* (Atlantic coast).<br>*Pecten aequisulcatus* (Pacific coast). |
| Sea | | *Pecten magellanicus.* |
| Squid | | *Loligo opalescens* (Pacific coast).<br>*Loligo pealei* (Atlantic coast). |
| Sea urchin | | Echinoidae class. |
| Starfish | | Asteroidae class. |
| Terrapin | Diamond-back terrapin | Malaclemmys species. |
| Turtle: | | |
| Green | | *Chelonia mydas.* |
| Loggerhead | | *Thalassochelys caretta.* |
| Hawksbill | | *Chelonia inbricata.* |
| Snapping | Hard shell, alligator turtle | *Chelydra serpentina.*<br>*Macrochelys lacertina.* |
| Soft shell | | *Trionyx* species. |
| Frog | | *Rana* species. |
| Irish moss | | *Chrondrus crispus.* |
| Kelp | | *Macrocystis* species; *Nerocystis* species; *Pelagophycus* species; *Alaria* species. |
| Bloodworm | | *Glycera dibranchiata.* |
| Sandworm | | *Nereis virens.* |
| Sponge: | | |
| Glove | | *Spongia graminea* (Hyatt) *Euspongia officianalis* (L.). |
| Grass | | *Hippospongia equina cerebriformis.* |
| Sheepswool | | *Hippospongia canaliculata gossypina.* |
| Yellow | | *Hippospongia equina elastica.* |
| Trepang | Sea cucumber | *Cucumaris frondosa.*<br>*Thyone briareus* |

UNITED STATES DEPARTMENT OF THE INTERIOR
HAROLD L. ICKES, Secretary

BUREAU OF FISHERIES
CHARLES E. JACKSON, Acting Commissioner

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Administrative Report No. 42

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# PROPAGATION AND DISTRIBUTION OF FOOD FISHES

## FISCAL YEAR 1940

By GLEN C. LEACH, M. C. JAMES
and E. J. DOUGLASS

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APPENDIX IV TO REPORT OF COMMISSIONER OF FISHERIES
FOR THE FISCAL YEAR 1940

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## ADMINISTRATIVE REPORT SERIES

Since the advent of the Administrative Report Series, considerable confusion has arisen concerning its system of numbering the separates composing it. Inasmuch as the Reports of the Divisions vary in order from year to year, many have found their designations as "Appendix No. I, II, III, or IV" very confusing. To relieve this, it has been decided to number them as "Administrative Report No.—." Inasmuch as 20 separates had already been printed in this series before starting the numbers, it was deemed advisable to begin the numbering with Administrative Report No. 21. Of course, numbers cannot be printed on those already off the press, but for the information of those who wish to know what the first 20 were, they are numbered for filing purposes as follows:

No. 1. Report, Commissioner of Fisheries, 1931.
No. 2. Alaska Fishery and Fur-Seal Industries, 1930.
No. 3. Fishery Industries of the United States, 1930.
No. 4. Progress in Biological Inquiries, 1930.
No. 5. Propagation and Distribution of Food Fishes, 1931.
No. 6. Report, Commissioner of Fisheries, 1932.
No. 7. Alaska Fishery and Fur-Seal Industries, 1931.
No. 8. Fishery Industries of the United States, 1931.
No. 9. Progress in Biological Inquiries, 1931.
No. 10. Propagation and Distribution of Food Fishes, 1932.
No. 11. Alaska Fishery and Fur-Seal Industries, 1932.
No. 12. Progress in Biological Inquiries, 1932.
No. 13. Fishery Industries of the United States, 1932.
No. 14. Propagation and Distribution of Food Fishes, 1933.
No. 15. Fishery Industries of the United States, 1933.
No. 16. Alaska Fishery and Fur-Seal Industries, 1933.
No. 17. Progress in Biological Inquiries, 1933.
No. 18. Propagation and Distribution of Food Fishes, 1934.
No. 19. Alaska Fishery and Fur-Seal Industries, 1934.
No. 20. Fishery Industries of the United States, 1934.

Note that the last Commissioner's Report was for 1932. Since then its place has been taken by a reprint from the Report of the Secretary of Commerce under the title "Bureau of Fisheries." Inasmuch as it is no longer a Bureau publication, it is not numbered; but it will be supplied to any who request the Report of the Commissioner for any year since 1932.

# PROPAGATION AND DISTRIBUTION OF FOOD FISHES, FISCAL YEAR 1940 [1]

By GLENN C. LEACH, *Chief*, M. C. JAMES, *Assistant Chief*, and E. J. DOUGLASS, *Superintendent of Distribution, Division of Fish Culture*

## CONTENTS

| | Page |
|---|---|
| Introduction | 555 |
| Species propagated | 556 |
| Production | 558 |
| Construction activities | 559 |
| Cooperation with other conservation agencies | 560 |
| Assignments of fish and fish eggs to States, Territories, and foreign countries | 566 |
| Station output | 569 |
| Egg collections | 577 |
| Notes on operations | 578 |
| Commercial species | 578 |
| Marine species | 580 |
| Great Lakes species | 582 |
| Anadromous species, Atlantic coast | 583 |
| Game-fish propagation | 584 |
| Rocky Mountain territory | 584 |
| New England trout stations | 588 |
| Combination trout and pondfish stations | 590 |
| Appalachian and Blue Ridge trout stations | 592 |
| Pondfish stations | 593 |
| Upper Mississippi River Wildlife and Fish Refuge | 598 |
| Aquarium | 599 |
| Distribution operations | 600 |
| Summary, by States, of the distribution of fish, fiscal year 1940 | 601 |

## INTRODUCTION

During the fiscal year 1940 the fish and eggs released from Federal fish hatcheries totaled approximately 617,300,000 less than in the previous year. The 1940 output amounted to 7,407,246,940; the reduction being 7.7 percent.

There was no curtailment of activities to account for this recession. However, with certain groups of fish the hatchery activities are governed by the same factors which cause fluctuations in the natural populations. Hence, hatchery production cannot be geared to a definite predetermined level, and all fish-culturists recognize that hatchery output will vary to a moderate degree from year to year. The nature of these fluctuations is discussed elsewhere in this report.

The older conception that artificial propagation and distribution of fish is a guaranteed stimulus for greater abundance and an assurance against depletion has been modified. The current attitude is to view the hatchery production as a supplement to natural production, or as a raw material upon which management practices can be based. This view imposes an obligation to give more careful consideration to all proposals for the extension of fish-cultural work into new fields, and to review the status of current activities. By concentrating hatchery production in comparatively restricted areas, positive results can generally be achieved. The cost of such local benefits may be excessive and judgment must be based upon the benefits accruing to fish populations as a whole.

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[1] Administrative Report No. 42, Appendix IV to the Report of the U. S. Commissioner of Fisheries for the fiscal year 1940. Approved for publication May 19, 1941.

The basic principles of animal husbandry are naturally applicable to the breeding of fish. Increased attention has therefore been given to selection of hatchery breeding stock and to the development of suitable diets. Sanitation has been emphasized as one of the best means of preventing undue mortality, and experimentation, with refinements in technique and equipment, has been conducted.

The emphasis during the year under review has been in the direction of improving existing hatcheries as to plant, equipment, and operating efficiency, with less thought to any program of expansion.

## SPECIES PROPAGATED

The Bureau hatcheries propagated, or handled in salvage activities, 50 different species. The larger percentage of this list covered the fresh-water and anadromous types, although the salt-water groups accounted for the major part of the output numerically.

Dolly Varden trout appeared in the listing for the first time in several years. There has been relatively little change, however, in the category of species propagated, because of the fact that the list already covers practically all forms which are readily amenable to methods of artificial culture.

Several varieties, such as the yellow or white perch, are propagated as a side line at hatcheries primarily intended for other species. These perch would not be handled unless the facilities were available during the off season on the hatching of shad.

The selection of the game species to be propagated at each of the hatcheries has been predicated upon a demand, which is an outgrowth of the geographical range of species. This takes into consideration the fact that many species have been transplanted beyond their normal range. Very little work of transplanting has been undertaken in recent years because of the belief that the fish population of the country has been quite thoroughly dispersed into the zones to which the species can be adapted. There is further evidence of the fact that distinctions between game and nongame species have largely broken down. Such distinctions are recognizable now only in the State fish and game laws, which frequently make an arbitrary separation of the two groups.

- Catfishes (*Siluridae*):
    - Yellow cat (*Opladelus olivaris*).
    - Spotted channel cat (*Ictalurus punctatus*).
    - Bullhead (*Ameiurus nebulosus*).
- Buffalofish (*Catostomidae*): Common buffaloes (*Ictiobus* sp.).
- Shad and herring (*Clupeidae*):
    - Shad (*Alosa sapidissima*).
    - Glut herring (*Pomolobus aestivalis*).
- Whitefishes and Lake herring (*Coregonidae*):
    - Common whitefish (*Coregonus clupeaformis*).
    - Lake herring, cisco (*Leucicthys* sp.).
- Salmons and trouts (*Salmonidae*):
    - King, chinook, or quinnat salmon (*Oncorhynchus tschawytscha*).
    - Chum salmon (*Oncorhynchus keta*).
    - Coho, or silver salmon (*Oncorhynchus kisutch*).

Red, sockeye, or blueback salmon (*Oncorhynchus nerka*).
Pink, or humpback salmon (*Oncorhynchus gorbuscha*).
Landlocked sockeye salmon, silver trout (*Oncorhynchus kennerlyi*).
Steelhead trout (*Salmo gairdnerii*).
Atlantic salmon (*Salmo salar*).
Landlocked salmon (*Salmo sebago*).
Golden trout (*Salmo agua-bonita*).
Rainbow trout (*Salmo irideus*).
Cut-throat trout, blackspotted trout (*Salmo clarkii*).
Brown, or Loch Leven trout (*Salmo fario* var.).
Lake trout, mackinaw trout (*Cristivomer namaycush*).
Brook trout (*Salvelinus fontinalis*).
Dolly Varden trout (*Salvelinus malma*).
Grayling (*Thymallidae*): Montana grayling (*Thymallus montanus*).
Pikes (*Esocidae*): Pike and pickerel (*Esox* sp.).
Sunfishes (*Centrarchidae*):
Crappie (*Pomoxis annularis* and *P. sparoides*).
Largemouth black bass (*Micropterus salmoides*).
Smallmouth black bass (*Micropterus dolomieu*).
Kentucky bass (*Micropterus pseudoplites*).
Rock bass (*Ambloplites rupestris*).
Warmouth bass (*Chaenobryttus gulosus*).
Bluegill sunfish (*Lepomis incisor*).
Green sunfish (*Lepomis cyanellus*).
Redbreasted bream (*Lepomis auritus*).
Red-eared sunfish (*Lepomis heros*).
Common sunfish (*Lepomis gibbosus*).
Mojarras de rio (*Cichlidae*).
Rio Grande perch (*Herichthys cyanoguttatus*).
Perches (*Percidae*):
Pikeperch (*Stizostedion vitreum*).
Yellow perch, ringed perch (*Perca flavescens*).
White basses (*Serranidae*):
White bass (*Roccus chrysops*).
Striped bass (*Roccus saxatilis*).
White perch (*Morone americana*).
Drums (*Sciaenidae*): Fresh-water drum, sheepshead (*Aplodinotus grunniens*).
Cods (*Gadidae*):
Cod (*Gadus callarias*).
Haddock (*Melanogrammus aeglefinus*).
Pollock (*Pollachius virens*).
Mackerel (*Scombridae*): Common mackerel (*Scomber scombrus*).
Flounders (*Pleuronectidae*): Winter flounder (*Pseudopleuronectes americanus*).
Lobster (*Homaridae*): Lobster (*Homarus americanus*).

*Summary, by species, of the output of fish and fish eggs during the fiscal year ended June 30, 1940*

| Species | Eggs | Fry | Fingerlings | Total |
|---|---|---|---|---|
| Catfish |  | 39, 000 | 2, 956, 715 | 2, 995, 715 |
| Buffalofish | 95, 872, 250 |  | 437, 600 | 96, 309, 850 |
| Shad |  | 42, 105, 000 | 99, 500 | 42, 204, 500 |
| Whitefish | 2, 000, 000 | 5, 660, 000 |  | 7, 660, 000 |
| Glut herring |  | 170, 000 |  | 170, 000 |
| Lake herring |  | 420, 000 |  | 420, 000 |
| Striped bass |  | 5, 917, 000 |  | 5, 917, 000 |
| Chinook salmon | 2, 340, 000 | 22, 797, 700 | 16, 309, 875 | 41, 447, 575 |
| Chum salmon | 795, 000 | 4, 437, 680 | 250, 200 | 5, 482, 880 |
| Humpback salmon |  | 230, 790 | 237, 000 | 467, 790 |
| Silver salmon |  |  | 1, 493, 765 | 1, 493, 765 |
| Sockeye salmon | 116, 380 |  | 2, 279, 125 | 2, 395, 505 |
| Sockeye salmon, landlocked | 548, 950 |  | 650, 585 | 1, 199, 535 |
| Landlocked salmon |  |  | 15, 645 | 15, 645 |
| Steelhead trout | 138, 550 |  | 1, 829, 935 | 1, 968, 485 |
| Rainbow trout | 16, 043, 060 | 411, 840 | 11, 146, 405 | 27, 601, 305 |
| Blackspotted trout | 32, 594, 080 | 9, 363, 330 | 9, 229, 205 | 51, 186, 615 |
| Loch Leven trout | 75, 640 | 101, 250 | 3, 152, 815 | 3, 329, 705 |
| Lake trout | 599, 500 | 1, 773, 500 | 264, 660 | 2, 637, 660 |
| Brook trout | 13, 236, 560 | 1, 468, 760 | 11, 835, 500 | 26, 540, 820 |
| Golden trout |  |  | 19, 855 | 19, 855 |
| Dolly Varden trout | 43, 750 |  |  | 43, 750 |
| Grayling | 4, 349, 000 |  | 255, 245 | 4, 604, 245 |

*Summary, by species, of the output of fish and fish eggs during the fiscal year ended June 30, 1940*—Continued

| Species | Eggs | Fry | Fingerlings | Total |
|---|---|---|---|---|
| Pike and pickerel | 6, 782, 810 | 940, 140 | 8, 910 | 7, 731, 860 |
| Crappie | | | 1, 683, 595 | 1, 683, 595 |
| Black bass, largemouth | | 2, 884, 100 | 7, 336, 455 | 10, 220, 555 |
| smallmouth | | 1, 065, 750 | 485, 675 | 1, 551, 425 |
| Kentucky bass | | 10, 000 | 28, 295 | 38, 295 |
| Rock bass | | | 208, 985 | 208, 985 |
| Warmouth bass | | | 37, 545 | 37, 545 |
| Sunfish | | | 10, 067, 925 | 10, 067, 925 |
| Rio Grande perch | | | 104, 660 | 104, 660 |
| Pikeperch | 1, 378, 360 | 8, 750, 000 | | 10, 128, 360 |
| Yellow perch | | 243, 082, 000 | 70, 375 | 243, 152, 375 |
| Fresh-water drum | | | 5, 600 | 5, 600 |
| White bass | | | 30, 745 | 30, 745 |
| White perch | | 2, 280, 000 | 1, 845 | 2, 281, 845 |
| Mackerel | | 8, 277, 000 | | 8, 277, 000 |
| Cod | 2, 613, 068, 110 | 191, 980, 100 | | 2, 805, 048, 210 |
| Haddock | 1, 066, 164, 500 | | | 1, 066, 164, 500 |
| Flatfish | 6, 607, 000 | 761, 525, 280 | | 768, 132, 280 |
| Pollock | 1, 962, 705, 490 | 174, 382, 490 | | 2, 137, 087, 980 |
| Lobster | 600, 000 | 8, 084, 000 | | 8, 684, 000 |
| Miscellaneous fishes | | | 497, 000 | 497, 000 |
| Total | 5, 826, 058, 990 | 1, 498, 156, 710 | 83, 031, 240 | 7, 407, 246, 940 |

## PRODUCTION

As stated in the introduction, there was a reduction of 7.7 percent in the 1940 distribution. Analysis of the 1939 and 1940 totals, however, shows that the difference was due to local conditions, and was restricted in its effect.

A reduction of 352,000,000 fish and eggs in 1940 was traceable to a change in the operation of the Put in Bay (Ohio) station, which produced that number of pikeperch and whitefish in 1939, then operated jointly with the State of Ohio. In 1940 this station was transferred to the full custody of the State, and the Bureau discontinued listing the output.

Also, the drop can be attributed in part to a shortage in the production of cod, haddock, and flounders. Activity with this group is governed by weather conditions, and the intensity of local commercial operations from which the eggs are obtained. Both of these factors were adverse during the winter of 1939–40.

As a matter of fact, 24 species were distributed in increased numbers, among them 6 species of trout, 1 variety of Pacific salmon, shad, striped bass, buffalofish, and lobster. There was a reduction of approximately 2,410,000 in the output of the black basses, which also are subject to adverse weather conditions during the spawning season. About 45 species were handled at the various hatcheries, exclusive of rescued fishes, during the year.

Despite the reduction in total ouptut, there was little change in the actual number of the fingerlings and larger sizes of game fish. It is gratifying to note that the production of game and pan species amounted to 151,114,500; an actual, as well as proportional increase. These forms comprised 2.04 percent of the total output, but it must be recognized that practically all of the species propagated are sought for recreation at certain times or places.

There was no large increase in production facilities, although increase in the number and size of ponds at some stations provided additional hatching and rearing facilities. A normal carry-over of fish remained on hand at the end of the year to provide for the distribution of large fingerlings and legal-sized fish during 1941. The new hatchery at Inks Dam, Tex., constructed with the aid of the N. Y. A., entered into production, distributing a moderate number of bass and pondfish in the waters of the Lower Colorado flood control impoundments.

## CONSTRUCTION ACTIVITIES

The major part of fish-hatchery construction during the year was in continuation of projects previously started. The 1940 appropriation carried funds for the establishment of hatcheries in Illinois and New Jersey, a substation in Maine, and/or the enlargement of the East Orland (Maine) Hatchery. Difficulty in selecting a site, and absence of State enabling legislation, prevented any action in Illinois. In New Jersey it was not possible to obtain a suitable site at a price low enough to permit adequate development.

A site near Salem, Maine, was selected for a small trout-rearing and bass-cultural unit, and the title was cleared late in the year. Construction of this unit was not started prior to June 30. At the East Orland Station, buildings and ponds were rehabilitated and provision was made for resumption of the propagation of Atlantic salmon. All appropriations for the above projects were continued available, and none of the projects were abandoned.

At the start of the year, previously approved hatchery projects at Hebron, Ohio, New London, Minn., and Farlington, Kans., entered a more active phase of construction. At the two former, appropriated funds were supplemented by W. P. A. allotments, and a large work camp was assigned to New London. Construction of the Kansas project was retarded by adverse weather conditions, and none of the establishments were developed to the point where fish-cultural work could be undertaken by the close of the year.

Toward the end of the 1939 fiscal year, allotments of P. W. A. funds were made available which provided $30,000 for the construction of a bass hatchery at Carbon Hill, Ala., and $60,000 for the development of fish-cultural facilities in Yellowstone Park. Of the latter sum, $20,000 was reallocated for the construction of the Glacier National Park hatchery at Creston, Mont. With the exception of the Yellowstone Park project, these jobs were nearing completion at the end of the year. The construction of the Glacier Park hatchery was taken over by the Bureau when the project was in an incomplete status. This work was initiated by the National Park Service, and upon the exhaustion of funds available to that agency it was necessary for the Bureau to assume responsibility for completion.

W. P. A. allotments totaling $188,047 were allocated to 20 fish-cultural stations for repairs, improvements, and further developmental work. Among the projects undertaken was the construction of four rearing ponds at Moorefield, W. Va., to serve as an auxiliary to the Leetown (W. Va.) station. This allotment supplemented the regular construction appropriations. Seventeen projects of a similar nature, which had been financed by W. P. A. allotments during the previous year, were continued in operation until these funds were expended. In addition, several W. P. A. projects were approved under State quotas covering similar work. The flexibility permitted under the procedure of transferring W. P. A. funds to the Bureau has been of great value in meeting unforeseen contingencies at the numerous field stations. There follows a listing of the Federal W. P. A. projects operated during the year. Among the larger projects under State quota was one providing for a continuation of the development of the bass hatchery at Arcadia, R. I.

*Stations receiving W. P. A. allotments during the fiscal year 1940*

| Location | Amount of W. P. A. project |
|---|---|
| Florida: Welaka | $10,000 |
| Georgia: | |
| Cohutta | 13,054 |
| Warm Springs | 10,000 |
| Indiana: Rochester | 10,000 |
| Iowa: Fairport | 2,500 |
| Louisiana: Natchitoches | 5,000 |
| Maine: East Orland | 4,000 |
| Michigan: Northville | 5,000 |
| Montana: Creston | 15,000 |
| New Hampshire: Nashua | 10,000 |
| New Mexico: | |
| Dexter | 6,890 |
| Santa Rosa | 7,978 |
| New York: Cortland | $5,000 |
| Ohio: Hebron | 54,720 |
| Pennsylvania: Lamar | 10,000 |
| Tennessee: Erwin | 1,510 |
| Texas: Fort Worth | 5,000 |
| Washington: Birdsview | 2,500 |
| West Virginia: | |
| Moorefield | 6,500 |
| White Sulphur Springs | 3,395 |
| Total | 188,047 |

In February 1940, a transfer of $40,000 was made by the Bureau of Reclamation to provide for the construction of a pondfish hatchery at Austin, Tex. The production from this unit is destined to supplement that from the Inks Dam (Tex.) hatchery in stocking the series of reservoirs developed by the Lower Colorado Authority. At the close of the year the active phase of the construction had been barely started, though equipment and materials were being procured. The site for this unit was donated by the city of Austin.

## COOPERATION WITH OTHER CONSERVATION AGENCIES

The Division of Fish Culture is vitally concerned in placing its products—fish and fish eggs—in environments where the greatest dividends will be derived from stocking. Because the Bureau's staff of biologists has been entirely inadequate to conduct surveys of all the inland waters of the United States, fish applications from individuals and clubs are submitted to more than 20 State fish and game commissions for approval before stocking the waters with the species requested. In some States the authorities stipulate the species, number, and size that will give best results; while in others the stocking programs have been formulated and the combined output of the State and Federal hatcheries has been budgeted to conform to these programs. The exchange of eggs and fish, especially trout and related species, has been of mutual benefit in a number of States.

The Bureau continued to cooperate with the National Park Service in the restocking of waters under its control. It appears that an all-time record will be established with regard to the number of black-spotted trout eggs collected from waters in Yellowstone Park this season.

In the Tennessee Valley area, three-way agreements between the Bureau of Fisheries, the Tennessee Valley Authority, and the States of Alabama, Tennessee, and North Carolina have been made effective. The Tennessee Valley Authority completed a pondfish hatchery, having a water area of 111 acres, on the Elk River in Alabama. The personnel assigned to that hatchery is now collecting brood stock and treating the pond bottoms to reduce the loss of water through seepage. The hatchery operated at Norris, Tenn., was enlarged during the year. The State conservation departments will distribute the fish produced at these units for the stocking of waters in that part of the Tennessee Valley area within their respective boundaries.

The New Jersey Board of Fish and Game Commissioners donated the services of its staff for the surveying of potential Federal pondfish hatchery sites in New Jersey. Further assistance was received from various State agencies in setting up W. P. A. projects to cover extensive construction programs at Federal hatcheries.

In view of the tremendous amount of angling in the waters within the national forests, there has been close cooperation between the Forest Service, of the Department of Agriculture, and the Bureau in an effort to maintain good fishing in those areas. More than 21,140,940 fish were assigned to the Forest Service for the stocking of suitable waters during the past year. Trout-rearing units were operated in the Chattahoochee, Nantahala, Pisgah, Allegheny, Huron, Marquette, Chequamegon, and Superior National Forests, and approximately 1½ million trout were reared to large fingerling, or legal size before liberation. A tabulation of these assignments follows:

*Fish planted in Forest Service waters, by regions, fiscal year 1940*

| Forest and species | State | Fry | Fingerlings, etc. | Total |
|---|---|---|---|---|
| REGION 1 | | | | |
| Beaverhead: Blackspotted trout | Montana | | 230,650 | 230,650 |
| Bitter Root: | Montana. | | | |
| Golden trout | | | 2,000 | 2,000 |
| Grayling | | | 21,450 | 21,450 |
| Rainbow trout | | | 4,480 | 4,480 |
| Cabinet: Blackspotted trout | Montana | | 114,000 | 114,000 |
| Coeur d'Alene: | Idaho. | | | |
| Blackspotted trout | | 20,400 | 297,525 | 317,925 |
| Brook trout | | | 25 | 25 |
| Rainbow trout | | | 65,000 | 65,000 |
| Custer: | Montana. | | | |
| Grayling | | | 15,000 | 15,000 |
| Rainbow trout | | | 37,240 | 37,240 |
| Deerlodge: | Montana. | | | |
| Blackspotted trout | | | 96,000 | 96,000 |
| Brook trout | | | 49,475 | 49,475 |
| Grayling | | | 9,000 | 9,000 |
| Rainbow trout | | | 30,000 | 30,000 |
| Gallatin: | Montana. | | | |
| Blackspotted trout | | | 322,000 | 322,000 |
| Brook trout | | | 21,260 | 21,260 |
| Golden trout | | | 6,000 | 6,000 |
| Grayling | | | 38,600 | 38,600 |
| Rainbow trout | | | 135,000 | 135,000 |
| Helena: Blackspotted trout | Montana | | 95,000 | 95,000 |
| Kaniksu: | Idaho. | | | |
| Blackspotted trout | | | 110,300 | 110,300 |
| Brook trout | | | 62,720 | 62,720 |
| Rainbow trout | | | 10,775 | 10,775 |
| Lewis and Clark: Blackspotted trout | Montana | | 26,800 | 26,800 |
| Lolo: | Montana. | | | |
| Blackspotted trout | | | 108,100 | 108,100 |
| Rainbow trout | | | 3,200 | 3,200 |
| St. Joe: Rainbow trout | Idaho | | 8,000 | 8,000 |

*Fish planted in Forest Service waters, by regions, fiscal year 1940*—Continued

| Forest and species | State | Fry | Fingerlings, etc. | Total |
|---|---|---|---|---|
| REGION 2 | | | | |
| Arapaho: | | | | |
| Blackspotted trout | | | 37,000 | 37,000 |
| Brook trout | | | 104,600 | 104,600 |
| Rainbow trout | | | 20,000 | 20,000 |
| Steelhead trout | | | 18,300 | 18,300 |
| Black Hills: | South Dakota. | | | |
| Blackspotted trout | | | 64,000 | 64,000 |
| Brook trout | | | 178,510 | 178,510 |
| Loch Leven trout | | | 600 | 600 |
| Rainbow trout | | | 130,280 | 130,280 |
| Cochetopa: | Colorado. | | | |
| Blackspotted trout | | | 165,000 | 165,000 |
| Brook trout | | | 48,000 | 48,000 |
| Rainbow trout | | | 28,000 | 28,000 |
| Gunnison: | Colorado. | | | |
| Blackspotted trout | | | 150,000 | 150,000 |
| Brook trout | | | 91,600 | 91,600 |
| Rainbow trout | | | 135,000 | 135,000 |
| Harney: Rainbow trout | South Dakota | | 40,650 | 40,650 |
| Holy Cross: | Colorado. | | | |
| Blackspotted trout | | | 71,000 | 71,000 |
| Brook trout | | | 119,280 | 119,280 |
| Rainbow trout | | | 50,000 | 50,000 |
| Medicine Bow: | Wyoming. | | | |
| Blackspotted trout | | | 142,380 | 142,380 |
| Rainbow trout | | | 267,735 | 267,735 |
| Montezuma: | Colorado. | | | |
| Blackspotted trout | | | 51,000 | 51,000 |
| Brook trout | | | 68,000 | 68,000 |
| Rainbow trout | | | 83,000 | 83,000 |
| Pike: | Colorado. | | | |
| Blackspotted trout | | | 52,500 | 52,500 |
| Brook trout | | | 82,860 | 82,860 |
| Loch Leven trout | | | 15,000 | 15,000 |
| Rainbow trout | | | 90,800 | 90,800 |
| Rio Grande: | Colorado. | | | |
| Blackspotted trout | | | 297,300 | 297,300 |
| Brook trout | | | 389,000 | 389,000 |
| Rainbow trout | | | 167,200 | 167,200 |
| Roosevelt: | Colorado. | | | |
| Blackspotted trout | | | 20,160 | 20,160 |
| Brook trout | | | 59,000 | 50,000 |
| Rainbow trout | | | 101,200 | 101,200 |
| Routt: | Colorado. | | | |
| Blackspotted trout | | | 59,180 | 59,180 |
| Brook trout | | | 10,200 | 10,200 |
| Rainbow trout | | | 7,500 | 7,500 |
| San Isabel: | Colorado. | | | |
| Blackspotted trout | | | 10,000 | 10,000 |
| Brook trout | | | 480 | 480 |
| Shoshone: | Wyoming. | | | |
| Blackspotted trout | | | 746,000 | 746,000 |
| Brook trout | | | 97,250 | 97,250 |
| Rainbow trout | | | 37,500 | 37,500 |
| Uncompahgre: | Colorado. | | | |
| Blackspotted trout | | | 20,000 | 20,000 |
| Brook trout | | | 77,400 | 77,400 |
| Washakie: | Wyoming. | | | |
| Blackspotted trout | | | 32,640 | 32,640 |
| Brook trout | | | 43,220 | 43,220 |
| Rainbow trout | | | 3,900 | 3,900 |
| White River: | Colorado. | | | |
| Blackspotted trout | | | 119,585 | 119,585 |
| Brook trout | | | 32,000 | 32,000 |
| Rainbow trout | | | 42,500 | 42,500 |
| REGION 3 | | | | |
| Carson: | New Mexico. | | | |
| Blackspotted trout | | | 92,000 | 92,000 |
| Rainbow trout | | | 4,500 | 4,500 |
| Cibola: | New Mexico. | | | |
| Catfish | | | 20 | 20 |
| Sunfish | | | 16,000 | 16,000 |
| Coconino: Black bass, largemouth | Arizona | | 20,000 | 20,000 |
| Gila: | New Mexico. | | | |
| Black bass: | | | | |
| Largemouth | | | 20,000 | 20,000 |
| Smallmouth | | | 15,000 | 15,000 |
| Crappie | | | 5,000 | 5,000 |
| Lincoln: Crappie | New Mexico | | 1,700 | 1,700 |
| Santa Fe: Black bass, smallmouth | New Mexico | | 500 | 500 |

*Fish planted in Forest Service waters, by regions, fiscal year 1940*—Continued

| Forest and species | State | Fry | Fingerlings, etc. | Total |
|---|---|---|---|---|
| REGION 4 | | | | |
| Ashley: | Utah. | | | |
| Blackspotted trout | | | 53,760 | 53,760 |
| Rainbow trout | | | 19,200 | 19,200 |
| Boise: Rainbow trout | Idaho | | 30,000 | 30,000 |
| Cache: | Utah. | | | |
| Blackspotted trout | | | 15,840 | 15,840 |
| Brook trout | | | 145,790 | 145,790 |
| Rainbow trout | | | 3,600 | 3,600 |
| Challis: | Idaho. | | | |
| Blackspotted trout | | | 10,240 | 10,240 |
| Rainbow trout | | | 72,140 | 72,140 |
| Dixie: Rainbow trout | Utah | | 1,000 | 1,000 |
| Fish Lake: | Utah. | | | |
| Blackspotted trout | | | 5,000 | 5,000 |
| Rainbow trout | | | 6,000 | 6,000 |
| Humboldt: | Nevada. | | | |
| Blackspotted trout | | | 57,000 | 57,000 |
| Brook trout | | | 25,000 | 25,000 |
| Rainbow trout | | | 44,520 | 44,520 |
| La Sal: Rainbow trout | Utah | | 20,000 | 20,000 |
| Lemhi: Rainbow trout | Idaho | | 44,820 | 44,820 |
| Manti: | Utah. | | | |
| Blackspotted trout | | | 23,600 | 23,600 |
| Brook trout | | | 12,780 | 12,780 |
| Rainbow trout | | | 22,000 | 22,000 |
| Minidoka: | Idaho. | | | |
| Blackspotted trout | | | 10,000 | 10,000 |
| Rainbow trout | | | 48,000 | 48,000 |
| Nevada: Rainbow trout | Nevada | | 69,545 | 69,545 |
| Salmon: | Idaho. | | | |
| Blackspotted trout | | | 163,940 | 163,940 |
| Golden trout | | | 22,280 | 22,280 |
| Rainbow trout | | | 374,080 | 374,080 |
| Sawtooth: | Idaho. | | | |
| Blackspotted trout | | | 50,500 | 50,500 |
| Brook trout | | | 80,000 | 80,000 |
| Landlocked sockeye salmon | | | 294,400 | 294,400 |
| Rainbow trout | | | 106,900 | 106,900 |
| Targhee: | Idaho. | | | |
| Blackspotted trout | | | 41,000 | 41,000 |
| Brook trout | | | 5,000 | 5,000 |
| Teton: | Wyoming. | | | |
| Blackspotted trout | | 212,000 | 221,090 | 433,090 |
| Brook trout | | 187,500 | 132,000 | 319,500 |
| Lake trout | | | 13,700 | 13,700 |
| Toiyabe: Rainbow trout | Nevada | | 27,640 | 27,640 |
| Uinta: | Utah. | | | |
| Blackspotted trout | | | 73,110 | 73,110 |
| Rainbow trout | | | 9,000 | 9,000 |
| Wasatch: | Utah. | | | |
| Blackspotted trout | | | 169,860 | 169,860 |
| Brook trout | | | 44,800 | 44,800 |
| Rainbow trout | | | 46,120 | 46,120 |
| Wyoming: | Wyoming. | | | |
| Blackspotted trout | | | 70,040 | 70,040 |
| Rainbow trout | | | 2,785 | 2,785 |
| REGION 6 | | | | |
| Columbia: | Washington. | | | |
| Blackspotted trout | | | 262,000 | 262,000 |
| Brook trout | | | 417,700 | 417,700 |
| Chinook salmon | | 932,700 | 229,330 | 1,162,030 |
| Rainbow trout | | | 414,335 | 414,335 |
| Mount Baker: | Washington. | | | |
| Blackspotted trout | | | 322,450 | 322,450 |
| Rainbow trout | | | 132,500 | 132,500 |
| Olympic: Rainbow trout | Washington | | 24,560 | 24,560 |
| REGION 7 | | | | |
| Allegheny: | Pennsylvania. | | | |
| Brook trout | | | 200,000 | 200,000 |
| Loch Leven trout | | | 10,000 | 10,000 |
| Rainbow trout | | | 58,800 | 58,800 |
| George Washington: | Virginia. | | | |
| Black bass, largemouth | | | 2,240 | 2,240 |
| Brook trout | | | 12,715 | 12,715 |
| Rainbow trout | | | 20,515 | 20,515 |
| Sunfish | | | 3,000 | 3,000 |
| Jefferson: | Virginia. | | | |
| Brook trout | | | 47,640 | 47,640 |
| Rainbow trout | | | 52,595 | 52,595 |

*Fish planted in Forest Service waters, by regions, fiscal year 1940*—Continued

| Forest and species | State | Fry | Fingerlings, etc. | Total |
|---|---|---|---|---|
| REGION 7—Continued | | | | |
| Monongahela: Black bass: | West Virginia. | | | |
| Largemouth | | | 1,325 | 1,325 |
| Smallmouth | | | 750 | 750 |
| White Mountain: Brook trout | New Hampshire | 25,000 | 38,605 | 63,605 |
| REGION 8 | | | | |
| Apalachicola: | Florida. | | | |
| Crappie | | | 800 | 800 |
| Sunfish | | | 14,200 | 14,200 |
| Black Warrior: Sunfish | Alabama | | 8,000 | 8,000 |
| Chattahoochee: | Georgia. | | | |
| Black bass, largemouth | | | 640 | 640 |
| Brook trout | | | 50,475 | 50,475 |
| Rainbow trout | | | 44,025 | 44,025 |
| Sunfish | | | 4,000 | 4,000 |
| Cherokee: | Tennessee. | | | |
| Brook trout | | | 281,990 | 281,990 |
| Rainbow trout | | | 478,235 | 478,235 |
| Sunfish | | | 1,620 | 1,620 |
| Conecuh: | Alabama. | | | |
| Black bass, largemouth | | | 6,400 | 6,400 |
| Sunfish | | | 3,850 | 3,850 |
| De Soto: | Mississippi. | | | |
| Black bass, largemouth | | | 1,500 | 1,500 |
| Sunfish | | | 7,500 | 7,500 |
| Francis Marion: Black bass, largemouth | South Carolina | | 20,000 | 20,000 |
| Holley Springs: Sunfish | Mississippi | | 7,000 | 7,000 |
| Kisatchie: | Louisiana. | | | |
| Black bass, largemouth | | | 59,750 | 59,750 |
| Sunfish | | | 210,000 | 210,000 |
| Nantahala: | North Carolina. | | | |
| Brook trout | | 50,000 | 32,230 | 82,230 |
| Loch Leven trout | | | 240 | 240 |
| Rainbow trout | | 35,000 | 16,960 | 51,960 |
| Ocala: | Florida. | | | |
| Black bass, largemouth | | 96,000 | 156,885 | 252,885 |
| Sunfish | | | 208,500 | 208,500 |
| Ouachita: | Arkansas. | | | |
| Black bass: | | | | |
| Largemouth | | | 15,000 | 15,000 |
| Smallmouth | | 20,000 | | 20,000 |
| Sunfish | | | 400 | 400 |
| Ozark: Black bass, smallmouth | Arkansas | | 24,000 | 24,000 |
| Pisgah: | North Carolina. | | | |
| Brook trout | | | 8,785 | 8,785 |
| Loch Leven trout | | | 9,910 | 9,910 |
| Rainbow trout | | | 31,090 | 31,090 |
| Sumpter: | South Carolina. | | | |
| Brook trout | | | 1,150 | 1,150 |
| Rainbow trout | | | 24,000 | 24,000 |
| Talladega: | Alabama. | | | |
| Black bass, largemouth | | | 9,400 | 9,400 |
| Sunfish | | | 5,000 | 5,000 |
| Unaka: Rainbow trout | North Carolina | | 2,100 | 2,100 |
| REGION 9 | | | | |
| Chequamegon: | Wisconsin. | | | |
| Black bass, largemouth | | | 2,000 | 2,000 |
| Brook trout | | | 13,200 | 13,200 |
| Crappie | | | 400 | 400 |
| Loch Leven trout | | | 7,500 | 7,500 |
| Sunfish | | | 3,975 | 3,975 |
| Chippewa: | Minnesota. | | | |
| Black bass, largemouth | | | 75 | 75 |
| Brook trout | | | 900 | 900 |
| Crappie | | | 645 | 645 |
| Rainbow trout | | | 11,050 | 11,050 |
| Clark: | Missouri. | | | |
| Black bass: | | | | |
| Largemouth | | 30,000 | 40,000 | 70,000 |
| Smallmouth | | 60,000 | | 60,000 |
| Catfish | | | 1,000 | 1,000 |
| Crappie | | | 810 | 810 |
| Sunfish | | | 3,550 | 3,550 |

*Fish planted in Forest Service waters, by regions, fiscal year 1940*—Continued

| Forest and species | State | Fry | Fingerlings, etc. | Total |
|---|---|---|---|---|
| REGION 9—Continued | | | | |
| Gardner: | Missouri. | | | |
| Black bass, largemouth | | | 2,700 | 2,700 |
| Rock bass | | | 1,700 | 1,700 |
| Sunfish | | | 750 | 750 |
| Hiawatha: Sunfish | Michigan | | 33,600 | 33,600 |
| Huron: | Michigan. | | | |
| Black bass, largemouth | | | 1,750 | 1,750 |
| Sunfish | | | 6,440 | 6,440 |
| Manistee: | Michigan. | | | |
| Black bass: | | | | |
| Largemouth | | | 19,125 | 19,125 |
| Smallmouth | | | 2,475 | 2,475 |
| Rainbow trout | | | 29,600 | 29,600 |
| Sunfish | | | 2,500 | 2,500 |
| Mark Twain: | Missouri. | | | |
| Black bass: | | | | |
| Largemouth | | | 74,150 | 74,150 |
| Smallmouth | | | 24,000 | 24,000 |
| Catfish | | | 500 | 500 |
| Crappie | | | 240 | 240 |
| Rainbow trout | | | 11,895 | 11,895 |
| Sunfish | | | 1,500 | 1,500 |
| Marquette: | Michigan. | | | |
| Black bass, largemouth | | | 2,900 | 2,900 |
| Brook trout | | | 48,000 | 48,000 |
| Loch Leven trout | | | 2,500 | 2,500 |
| Sunfish | | | 525 | 525 |
| Yellow perch | | | 2,500 | 2,500 |
| Nicolet: | Wisconsin. | | | |
| Brook trout | | | 143,600 | 143,600 |
| Rainbow trout | | | 22,600 | 22,600 |
| Ottawa: | Michigan. | | | |
| Brook trout | | | 26,775 | 26,775 |
| Sunfish | | | 4,200 | 4,200 |
| Superior: | Minnesota. | | | |
| Brook trout | | | 682,000 | 682,000 |
| Crappie | | | 1,175 | 1,175 |
| Lake trout | | 351,000 | 20,000 | 371,000 |
| Loch Leven trout | | | 108,000 | 108,000 |
| Pikeperch | | 4,140,000 | | 4,140,000 |
| Pike and pickerel | | 100,000 | | 100,000 |
| Rainbow trout | | | 51,150 | 51,150 |
| Sunfish | | | 18,980 | 18,980 |

The Bureau of Reclamation has continued its efforts to preserve the runs of salmon in the Columbia and Sacramento Rivers, where the survival of this species is threatened by the construction of huge dams. In connection with this work, one of the four salmon hatcheries originally contemplated has been partially completed and placed in limited operation.

In organizing the various cooperative procedures with the States, several general conferences with State conservation officials have been held in connection with conferences and meetings concerned with wildlife programs. In addition, there has been frequent individual contact with various State departments in an effort to settle specific problems. As an example, there may be mentioned the discussions with the Missouri Conservation Department looking toward the zoning of the State for fish-distribution purposes.

As an indication of the magnitude of assignments to Federal waters under the jurisdiction of agencies other than the Forest Service, there follows a tabulated statement in which it will be noted that six different agencies were the beneficiaries of such assignments, and some stocking also was carried on in waters under the control of several other Federal organizations:

*Fish and fish eggs planted in Federal waters, other than Forest Service, fiscal year 1940*

| Species | Eggs | Fry | Fingerlings, etc. | Total |
|---|---|---|---|---|
| BUREAU OF RECLAMATION | | | | |
| Black bass, largemouth | | | 634, 675 | 634, 675 |
| Crappie | | | 13, 800 | 13, 800 |
| Rainbow trout | | | 43, 000 | 43, 000 |
| FARM SECURITY ADMINISTRATION | | | | |
| Catfish | | | 7, 840 | 7, 840 |
| Crappie | | | 16, 625 | 16, 625 |
| Sunfish | | | 800 | 800 |
| OFFICE OF INDIAN AFFAIRS | | | | |
| Black bass, largemouth | | | 400 | 400 |
| Blackspotted trout | 100, 125 | | 49, 600 | 149, 725 |
| Brook trout | | | 25, 345 | 25, 345 |
| Catfish | | | 20, 160 | 20, 160 |
| Crappie | | | 5, 280 | 5, 280 |
| Rainbow trout | | | 28, 795 | 28, 795 |
| Sunfish | | | 260 | 260 |
| NATIONAL PARK SERVICE | | | | |
| Black bass, largemouth | | 4, 000 | 44, 400 | 48, 400 |
| Blackspotted trout | 3, 516, 350 | 8, 342, 855 | 1, 600, 185 | 13, 459, 390 |
| Brook trout | | 100, 000 | 411, 200 | 511, 200 |
| Grayling | 2, 847, 990 | | | 2, 847, 990 |
| Rainbow trout | 50, 160 | 376, 840 | 406, 905 | 833, 905 |
| Sunfish | | | 7, 320 | 7, 320 |
| SOIL CONSERVATION SERVICE | | | | |
| Black bass, largemouth | | 59, 000 | 31, 500 | 90, 500 |
| Catfish | | | 16, 500 | 16, 500 |
| Crappie | | | 4, 000 | 4, 000 |
| TENNESSEE VALLEY AUTHORITY | | | | |
| Black bass, largemouth | | 430, 000 | 22, 250 | 452, 250 |
| Kentucky bass | | | 25, 630 | 25, 630 |
| Pikeperch | | 500, 000 | | 500, 000 |
| Rainbow trout | | | 25, 000 | 25, 000 |
| Rock bass | | | 1, 520 | 1, 520 |
| Sunfish | | | 53, 000 | 53, 000 |
| Miscellaneous fishes | | | 30, 000 | 30, 000 |

## ASSIGNMENTS OF FISH AND FISH EGGS TO STATES, TERRITORIES, AND FOREIGN COUNTRIES

The fish-cultural programs of 41 States were promoted by the assignment of over 69 million fish and eggs. This is in comparison with over 165 million allotted during the fiscal year 1939. The recession is explained by the fact that diversion of flounder fry to the State of Rhode Island declined from 121,455,000 in 1939 to 11,403,000 in 1940, the drop being due to small egg collections of this species at the Woods Hole (Mass.) station. There was, however, a net increase of approximately 10 million in the allotments of miscellaneous species.

Many of the fish listed in the following table were simply turned over to the States for immediate distribution, thereby relieving the Bureau of this responsibility. As heretofore, however, millions of eggs went into the State hatcheries to constitute the principal source of supply for certain varieties of trout. The States generally reciprocated by filling Federal fish applications for waters in the vicinity of their hatcheries. It will be noted that the Bureau hatched and turned over to the Maine lobster-rearing station 7,172,000 lobster fry, in comparison with 46,450 lobster fry handled in 1939.

The policy illustrated by this activity is the most concrete evidence of the fruition of the program of coordinating State and Federal fish production and distribution. The totals listed in the following table are included within the gross output of the Federal hatcheries and are therefore not to be considered as a separate category within the general summaries.

*Assignments of fish and fish eggs to State fish commissions, fiscal year 1940*

| States and species | Eggs | Fry | Fingerlings, etc. | Total |
|---|---|---|---|---|
| Alabama: | | | | |
| Black bass, largemouth | | | 66,515 | 66,515 |
| Crappie | | | 200 | 200 |
| Sunfish | | | 289,745 | 289,745 |
| Arizona: | | | | |
| Black bass, largemouth | | | 50,000 | 50,000 |
| Blackspotted trout | 200,000 | | | 200,000 |
| Brook trout | 500,000 | | | 500,000 |
| Arkansas: Sunfish | | | 7,950 | 7,950 |
| Colorado: | | | | |
| Blackspotted trout | 1,000,200 | | | 1,000,200 |
| Brook trout | | | 7,540 | 7,540 |
| Steelhead trout | | | 15,000 | 15,000 |
| Connecticut: Black bass, smallmouth | | 298,000 | | 298,000 |
| Florida: | | | | |
| Black bass, largemouth | | | 91,150 | 91,150 |
| Sunfish | | | 176,900 | 176,900 |
| Georgia: | | | | |
| Black bass: | | | | |
| Largemouth | | | 103,600 | 103,600 |
| Smallmouth | | | 875 | 875 |
| Crappie | | | 146,200 | 146,200 |
| Kentucky bass | | | 645 | 645 |
| Rainbow trout | 270,000 | | 8,400 | 278,400 |
| Sunfish | | | 273,450 | 273,450 |
| Idaho. | | | | |
| Black bass, smallmouth | | 6,000 | | 6,000 |
| Blackspotted trout | 1,580,910 | | | 1,580,910 |
| Brook trout | | 126,000 | 306,630 | 432,630 |
| Dolly Varden trout | 43,750 | | | 43,750 |
| Grayling | 250,250 | | 15,000 | 265,250 |
| Landlocked sockeye salmon | 74,250 | | 119,185 | 193,435 |
| Rainbow trout | 575,500 | | 53,000 | 628,500 |
| Illinois: | | | | |
| Black bass: | | | | |
| Largemouth | | | 400 | 400 |
| Smallmouth | | 50,000 | | 50,000 |
| Catfish | | | 3,600 | 3,600 |
| Loch Leven trout | | | 5,000 | 5,000 |
| Sunfish | | | 207,000 | 207,000 |
| Indiana: | | | | |
| Brook trout | | | 115,200 | 115,200 |
| Loch Leven trout | | | 98,100 | 98,100 |
| Rainbow trout | | | 128,000 | 128,000 |
| Iowa: | | | | |
| Black bass, largemouth | | | 29,850 | 29,850 |
| Brook trout | | | 50,000 | 50,000 |
| Crappie | | | 4,500 | 4,500 |
| Rainbow trout | | | 50,000 | 50,000 |
| Sunfish | | | 90,500 | 90,500 |
| Kentucky: | | | | |
| Black bass: | | | | |
| Largemouth | | 13,650 | | 13,650 |
| Smallmouth | | 16,500 | | 16,500 |
| Rock bass | | | 3,000 | 3,000 |
| Sunfish | | | 2,400 | 2,400 |
| Maine: | | | | |
| Chinook salmon | 25,000 | | | 25,000 |
| Lobster | | 7,172,000 | | 7,172,000 |
| Maryland: | | | | |
| Brook trout | | | 650 | 650 |
| Rainbow trout | | | 35,500 | 35,500 |
| Shad | | 3,000,000 | | 3,000,000 |

*Assignments of fish and fish eggs to State fish commissions, fiscal year 1940*—Con.

| States and species | Eggs | Fry | Finger-lings, etc. | Total |
|---|---|---|---|---|
| Massachusetts: Rainbow trout | 50, 000 | | | 50, 000 |
| Michigan: Rainbow trout | 1, 364, 500 | | | 1, 364, 500 |
| Minnesota: Blass bass, largemouth | | | 48, 400 | 48, 400 |
| Missouri: | | | | |
| Black bass: | | | | |
| Largemouth | | | 20, 400 | 20, 400 |
| Smallmouth | | 120, 000 | | 120, 000 |
| Montana: | | | | |
| Black bass, largemouth | | | 6, 050 | 6, 050 |
| Blackspotted trout | 2, 850, 890 | | | 2, 850, 890 |
| Brook trout | | | 90, 525 | 90, 525 |
| Catfish | | | 34, 615 | 34, 615 |
| Crappie | | | 23, 860 | 23, 860 |
| Golden trout | | | 100 | 100 |
| Grayling | | | 4, 500 | 4, 500 |
| Loch Leven trout | | | 127, 000 | 127, 000 |
| Rainbow trout | | | 10, 260 | 10, 260 |
| Sunfish | | | 19, 705 | 19, 705 |
| Nebraska: | | | | |
| Brook trout | | | 3, 000 | 3, 000 |
| Rainbow trout | | | 4, 200 | 4, 200 |
| Nevada: | | | | |
| Blackspotted trout | | | 10, 000 | 10, 000 |
| Brook trout | | | 10, 000 | 10, 000 |
| Rainbow trout | | | 10, 000 | 10, 000 |
| Sunfish | | | 3, 000 | 3, 000 |
| New Hampshire: | | | | |
| Brook trout | 50, 000 | | 312, 985 | 362, 985 |
| Loch Leven trout | | | 100 | 100 |
| New Jersey: Rainbow trout | 73, 020 | | | 73, 020 |
| New Mexico: | | | | |
| Black bass: | | | | |
| Largemouth | | | 190, 285 | 190, 285 |
| Smallmouth | | | 52, 450 | 52, 450 |
| Blackspotted trout | 1, 600, 340 | | | 1, 600, 340 |
| Catfish | | | 24, 500 | 24, 500 |
| Crappie | | | 48, 450 | 48, 450 |
| Rainbow trout | 622, 730 | | | 622, 730 |
| Sunfish | | | 322, 750 | 322, 750 |
| New York: | | | | |
| Brook trout | | | 21, 150 | 21, 150 |
| Rainbow trout | 400, 000 | | 10, 625 | 410, 625 |
| North Carolina: | | | | |
| Black bass: | | | | |
| Largemouth | | | 47, 000 | 47, 000 |
| Smallmouth | | | 1, 750 | 1, 750 |
| Rainbow trout | 600, 000 | | 6, 580 | 606, 580 |
| Sunfish | | | 27, 000 | 27, 000 |
| Ohio: Rainbow trout | | | 67, 200 | 67, 200 |
| Oregon: | | | | |
| Blackspotted trout | 2, 331, 110 | | | 2, 331, 110 |
| Brook trout | | | 137, 090 | 137, 090 |
| Rainbow trout | | | 58, 590 | 58, 590 |
| Steelhead trout | 100, 050 | | | 100, 050 |
| Pennsylvania: Loch Leven trout | | | 240, 000 | 240, 000 |
| Rhode Island: Flatfish | | 11, 403, 000 | | 11, 403, 000 |
| South Carolina: | | | | |
| Black bass, largemouth | | | 7, 500 | 7, 500 |
| Loch Leven trout | | | 2, 975 | 2, 975 |
| Rainbow trout | 125, 000 | | | 125, 000 |
| South Dakota: | | | | |
| Loch Leven trout | | | 1, 000 | 1. 000 |
| Rainbow trout | | | 10, 105 | 10, 105 |
| Tennessee: Rainbow trout | 75, 000 | | | 75, 000 |
| Texas: | | | | |
| Sunfish | | | 42, 250 | 42, 250 |
| Warmouth bass | | | 3, 200 | 3, 200 |
| Utah: | | | | |
| Blackspotted trout | 1, 500, 100 | | | 1, 500, 100 |
| Brook trout | 505, 060 | | 24, 825 | 529, 885 |
| Grayling | 500, 220 | | | 500, 220 |
| Vermont: | | | | |
| Black bass: | | | | |
| Largemouth | | | 14, 550 | 14, 550 |
| Smallmouth | | 15, 000 | | 15, 000 |
| Brook trout | | 620, 000 | 128, 400 | 748, 400 |
| Landlocked salmon | | | 15, 645 | 15, 645 |
| Loch Leven trout | | | 31, 800 | 31, 800 |
| White perch | | | 1, 000 | 1, 000 |

*Assignments of fish and fish eggs to State fish commissions, fiscal year 1940*—Con.

| States and species | Eggs | Fry | Finger-lings, etc. | Total |
|---|---|---|---|---|
| Virginia: | | | | |
| Brook trout |  |  | 81, 540 | 81, 540 |
| Rainbow trout |  |  | 194, 850 | 194, 850 |
| Sunfish |  |  | 22. 475 | 22, 475 |
| Yellow perch |  | 18, 924, 000 |  | 18, 921, 000 |
| Washington: | | | | |
| Blackspotted trout | 550, 300 |  | 117, 580 | 667, 880 |
| Brook trout |  |  | 285. 950 | 285, 950 |
| Rainbow trout | 460, 000 |  | 287, 485 | 747, 485 |
| Sockeye salmon | 100, 730 |  | 10, 000 | 110, 730 |
| West Virginia: | | | | |
| Brook trout |  |  | 15, 245 | 15, 245 |
| Loch Leven trout |  |  | 30, 390 | 30, 390 |
| Rainbow trout |  |  | 100, 865 | 100, 865 |
| Wisconsin: | | | | |
| Black bass, largemouth |  |  | 263, 600 | 263, 600 |
| Brook trout |  |  | 40, 000 | 40, 000 |
| Lock Leven trout |  |  | 19, 000 | 19, 00 |
| Rainbow trout |  |  | 32, 000 | 32, 000 |
| Sunfish |  |  | 600 | 600 |
| Wyoming: | | | | |
| Blackspotted trout | 2, 500, 380 |  | 3, 000 | 2, 503, 380 |
| Brook trout |  |  | 19, 200 | 19, 200 |
| Grayling | 300, 130 |  | 10, 000 | 310, 130 |
| Lock Leven trout |  |  | 47, 600 | 47, 600 |
| Rainbow trout |  |  | 12, 400 | 12. 400 |
| Total | 21, 181, 420 | 41, 764, 150 | 6, 426, 835 | 69, 372, 405 |

Slightly more than 2½ million eggs of three species went into overseas shipments. The Territory of Hawaii and Puerto Rico each received rainbow-trout eggs, the species being well established in each of these areas; but with little or no natural reproduction. The shipment of lake-trout eggs to Peru was quite successful in comparison with the failure of the previous attempt. Whitefish eggs also survived the long trip but were lost during the subsequent incubation period.

An appropriation to finance such cooperative work with the American republics is highly necessary in view of the technical difficulties encountered. Such an appropriation became available for the fiscal year 1941.

*Shipments of fish eggs to territories, possessions, and foreign countries, fiscal year 1940*

| Country and species | Number | Station from which shipped |
|---|---|---|
| Colombia: Rainbow trout | 51, 070 | Eagle Nest, N. M. |
| Hawaii: Rainbow trout | 25, 000 | Birdsview, Wash. |
| Peru: | | |
| Lake trout | 234, 500 | Cape Vincent, N. Y. |
| Whitefish | 2, 000, 000 | Put in Bay, Ohio. |
| Puerto Rico: Rainbow trout | 255, 200 | Bourbon, Mo. |
| Total | 2, 565, 770 | |

## STATION OUTPUT

One hundred and four units contributed to the gross production at the Federal hatcheries during 1940. These included coooperative units and the major Forest Service nurseries, as well as the hatcheries established by statutory provision. While the Put in Bay (Ohio) station is credited with a production of whitefish and pikeperch, such a showing is made because of the fact that eggs furnished by the State of Ohio were transferred to other activities by shipment from Put in Bay. A new cooperative unit located at Mullan, Idaho, is listed in production for the first time. This complete hatchery was constructed by a local sportsmen's organization, and operating responsibility has been assumed by the Bureau.

For administrative reasons the segregation of hatcheries into main stations (numbering 53) and substations (numbering 51) was continued. Such a designation is arbitrary and does not necessarily reflect the relative importance of the different activities in terms of fish production. Several units were operated seasonally, including the Yellowstone Park Hatchery, the Weldon (N. C.) substation, and the Eagle Nest Lake (N. Mex.) egg-collecting station. An additional unit entering production was the pondfish hatchery at Inks Dam, near Burnet, Tex.

Upon completion of the present construction program only the States of Delaware, Connecticut, and Maryland will be without at least one Federal fish-cultural unit. In a number of instances the numerical output of a station was deliberately curtailed in order to permit the rearing of fish to larger size before distribution.

*Stations and substations operated, and the output of each, fiscal year 1940*

| Stations, substations, and species | Eggs | Fry | Fingerlings | Total |
|---|---|---|---|---|
| Berlin, N. H.: Brook trout | | 249, 100 | 351, 585 | 600, 685 |
| *St. Johnsbury, Vt.:* | | | | |
| Brook trout | | 530. 000 | | 530, 000 |
| Loch Leven trout | | | 41, 800 | 41, 800 |
| Landlocked salmon | | | 15, 645 | 15. 645 |
| Black bass, largemouth | | | 20, 300 | 20, 300 |
| Birdsview, Wash.: | | | | |
| Blackspotted trout | | | 152, 000 | 152, 000 |
| Brook trout | | | 131, 500 | 131, 500 |
| Rainbow trout | 51, 000 | | 99. 775 | 150, 775 |
| Steelhead trout | 38, 500 | | 810, 000 | 848, 500 |
| Chinook salmon | | | 596, 290 | 596, 290 |
| Humpback salmon | | | 237, 000 | 237, 000 |
| Silver salmon | | | 736, 900 | 736, 900 |
| Sockeye salmon | | | 17, 645 | 17. 645 |
| *Baker Lake, Wash.:* | | | | |
| Blackspotted trout | | | 180, 450 | 180, 450 |
| Brook trout | | | 77, 900 | 77, 900 |
| Rainbow trout | | | 50, 000 | 50, 000 |
| *Mount Rainier, Wash.:* | | | | |
| Blackspotted trout | | | 173, 570 | 173, 570 |
| Brook trout | | | 91, 000 | 91, 000 |
| Rainbow trout | | | 14, 500 | 14. 500 |
| *Spokane, Wash.:* | | | | |
| Blackspotted trout | | | 39, 980 | 39, 980 |
| Brook trout | | | 88, 400 | 88, 400 |
| Rainbow trout | | | 267, 085 | 267, 085 |
| Boothbay Harbor, Maine: | | | | |
| Cod | 1, 282, 103, 000 | | | 1, 282. 103, 000 |
| Flatfish | | 612, 900, 000 | | 612, 900, 000 |
| Haddock | 253. 582, 000 | | | 253, 582, 000 |
| Pollock | 1, 060, 000, 000 | | | 1, 060, 000, 000 |
| Lobster | 600. 000 | 7, 532, 000 | | 8, 132, 000 |
| Bozeman, Mont.: | | | | |
| Blackspotted trout | | 527, 500 | 1, 445, 560 | 1. 973, 060 |
| Brook trout | | | 756, 885 | 756, 885 |
| Golden trout | | | 8, 715 | 8, 71 |
| Loch Leven trout | | | 127, 000 | 127, 00 |
| Rainbow trout | | | 601, 615 | 601, 615 |
| Grayling | | | 252, 550 | 252, 550 |
| *Ennis, Mont.:* | | | | |
| Blackspotted trout | | | 453. 050 | 453, 050 |
| Brook trout | | | 72, 200 | 72, 200 |
| Loch Leven trout | | | 1, 277. 080 | 1, 277, 080 |
| Rainbow trout | | | 600, 245 | 600, 245 |
| Grayling | | | 2, 695 | 2, 695 |

NOTE.—Stations *italicized* are substations of the preceding station in roman type.

*Stations and substations operated, and the output of each, fiscal year 1940*—Continued

| Stations, substations, and species | Eggs | Fry | Fingerlings | Total |
|---|---|---|---|---|
| *Miles City, Mont.:* | | | | |
| Black bass, largemouth | | | 25,675 | 25,675 |
| Catfish | | | 133,075 | 133,075 |
| Crappie | | | 94,725 | 94,725 |
| Sunfish | | | 83,445 | 83,445 |
| Cape Vincent, N. Y.: | | | | |
| Brook trout | | 224,000 | | 224,000 |
| Lake trout | 299,500 | 201,000 | | 500,500 |
| Loch Leven trout | | 86,000 | 3,970 | 89,970 |
| Rainbow trout | | | 3,530 | 3,530 |
| Lake herring | | 140,000 | | 140,000 |
| Whitefish | | 4,460,000 | | 4,460,000 |
| Black bass, smallmouth | | 28,250 | 127,220 | 155,470 |
| *Barneveld, N. Y.:* | | | | |
| Brook trout | | | 191,750 | 191,750 |
| Loch Leven trout | | | 31,500 | 31,500 |
| Rainbow trout | | | 41,750 | 41,750 |
| *Cortland, N. Y.:* | | | | |
| Brook trout | | | 95,300 | 95,300 |
| Loch Leven trout | | | 44,490 | 44,490 |
| Rainbow trout | | | 20,815 | 20,815 |
| *Watertown, N. Y.:* | | | | |
| Brook trout | | | 81,265 | 81,265 |
| Loch Leven trout | | | 64,720 | 64,720 |
| Rainbow trout | | | 14,110 | 14,110 |
| Carson, Wash.: | | | | |
| Blackspotted trout | | | 282,000 | 282,000 |
| Brook trout | | | 232,700 | 232,700 |
| Rainbow trout | | | 379,900 | 379,900 |
| Chinook salmon | | 932,700 | 425,200 | 1,357,900 |
| *Little White Salmon, Wash.:* Chinook salmon | 300,000 | 11,343,000 | | 11,643,000 |
| *Big White Salmon, Wash.:* | | | | |
| Brook trout | | | 178,000 | 178,000 |
| Rainbow trout | | | 985,305 | 985,305 |
| Chinook salmon | 2,000,000 | 10,522,000 | 7,620,485 | 20,142,485 |
| Clackamas, Oreg.: | | | | |
| Blackspotted trout | | | 11,000 | 11,000 |
| Brook trout | | | 154,090 | 154,090 |
| Rainbow trout | | | 119,690 | 119,690 |
| Chinook salmon | | | 346,500 | 346,500 |
| *Battle Creek, Calif.:* Chinook salmon | 40,000 | | 4,532,180 | 4,572,180 |
| *Butte Falls, Oreg.:* | | | | |
| Rainbow trout | | | 463,945 | 463,945 |
| Steelhead trout | 100,050 | | 712,620 | 812,670 |
| Chinook salmon | | | 1,391,560 | 1,391,560 |
| Silver salmon | | | 57,445 | 57,445 |
| *Mill Creek, Calif.:* Chinook salmon | | | 1,033,310 | 1,033,310 |
| Clark Fork, Idaho: | | | | |
| Blackspotted trout | | | 181,900 | 181,900 |
| Brook trout | | 126,000 | 417,530 | 543,530 |
| Dolly Varden trout | 43,750 | | | 43,750 |
| Rainbow trout | | | 5,775 | 5,775 |
| Landlocked sockeye salmon | 548,950 | | 119,185 | 668,135 |
| Craig Brook, Maine: | | | | |
| Brook trout | 3,200,000 | | 269,495 | 3,469,495 |
| Lake trout | | | 7,500 | 7,500 |
| White perch | | | 1,000 | 1,000 |
| Crawford, Nebr.: | | | | |
| Blackspotted trout | | | 980,000 | 980,000 |
| Brook trout | | | 281,900 | 281,900 |
| Loch Leven trout | | | 12,000 | 12,000 |
| Rainbow trout | | | 361,300 | 361,300 |
| Black bass | | | 21,270 | 21,270 |
| Catfish | | | 65,200 | 65,200 |
| Crappie | | | 22,160 | 22,160 |
| Rock bass | | | 13,880 | 13,880 |
| Yellow perch | | | 3,345 | 3,345 |
| Dexter, N. Mex.: | | | | |
| Black bass: | | | | |
| Largemouth | | | 238,085 | 238,085 |
| Smallmouth | | | 3,200 | 3,200 |
| Catfish | | | 24,850 | 24,850 |
| Crappie | | | 71,150 | 71,150 |
| Sunfish | | | 180,900 | 180,900 |
| *Santa Rosa, N. Mex.:* | | | | |
| Black bass: | | | | |
| Largemouth | | | 36,100 | 36,100 |
| Smallmouth | | | 49,750 | 49,750 |
| Catfish | | | 1,100 | 1,100 |
| Sunfish | | | 188,550 | 188,550 |

*Stations and substations operated, and the output of each, fiscal year 1940*—Continued

| Stations, substations, and species | Eggs | Fry | Fingerlings | Total |
|---|---|---|---|---|
| Duluth, Minn.: | | | | |
| Brook trout | | | 696, 000 | 696, 000 |
| Lake trout | 300, 000 | 1, 572, 500 | 25, 000 | 1, 897, 500 |
| Loch Leven trout | | | 111, 000 | 111, 000 |
| Rainbow trout | | | 9, 000 | 9, 000 |
| Lake herring | | 280, 000 | | 280, 000 |
| Pikeperch | | 6, 700, 000 | | 6, 700, 000 |
| Pike and pickerel | | 200, 000 | | 200, 000 |
| Whitefish | | 1, 200, 000 | | 1, 200, 000 |
| Edenton, N. C.: | | | | |
| Black bass: Largemouth | | 50, 500 | 69, 590 | 120, 090 |
| Crappie | | | 1, 875 | 1, 875 |
| Sunfish | | | 93, 800 | 93, 800 |
| Warmouth bass | | | 13, 000 | 13, 000 |
| Glut herring | | 170, 000 | | 170, 000 |
| Shad | | 13, 600, 000 | 12, 000 | 13, 612, 000 |
| White perch | | 2, 280, 000 | 845 | 2, 280, 845 |
| Yellow perch | | 1, 360, 000 | 535 | 1, 360, 535 |
| *Weldon, N. C.:* Striped bass | | 5, 917, 000 | | 5, 917, 000 |
| Elephant Butte, N. Mex.: | | | | |
| Black bass: Largemouth | | | 664, 075 | 664, 075 |
| Crappie | | | 7, 200 | 7, 200 |
| Sunfish | | | 31, 000 | 31, 000 |
| Erwin, Tenn.: | | | | |
| Brook trout | | | 306, 675 | 306, 675 |
| Loch Leven trout | | | 8, 100 | 8, 100 |
| Rainbow trout | | | 622, 800 | 622, 800 |
| Black bass: | | | | |
| Largemouth | | 500, 000 | 85, 915 | 585, 915 |
| Smallmouth | | | 1, 600 | 1, 600 |
| Rock bass | | | 14, 950 | 14, 950 |
| Sunfish | | | 75, 095 | 75, 095 |
| Fairport, Iowa: | | | | |
| Black bass: | | | | |
| Largemouth | | 98, 000 | 93, 940 | 191, 940 |
| Smallmouth | | | 500 | 500 |
| Catfish | | 39, 000 | 316, 125 | 355, 125 |
| Crappie | | | 39, 375 | 39, 375 |
| Sunfish | | | 612, 120 | 612, 120 |
| White bass | | | 245 | 245 |
| Buffalofish | 50, 300, 000 | | 4, 200 | 50, 304, 200 |
| Drum | | | 200 | 200 |
| Miscellaneous fishes | | | 11, 000 | 11, 000 |
| Flintville, Tenn.: | | | | |
| Rainbow trout | | | 179, 200 | 179, 200 |
| Black bass: | | | | |
| Largemouth | | | 350 | 350 |
| Smallmouth | | | 405 | 405 |
| Rock bass | | | 4, 200 | 4, 200 |
| Sunfish | | | 16, 150 | 16, 150 |
| Fort Belvoir, Va.: | | | | |
| Black bass, largemouth | | | 165 | 165 |
| Crappie | | | 2, 715 | 2, 715 |
| Sunfish | | | 26, 200 | 26, 200 |
| Shad | | 27, 920, 000 | | 27, 920, 000 |
| Yellow perch | | 241, 722, 000 | | 241, 722, 000 |
| Glacier National Park, Mont.: | | | | |
| Blackspotted trout | | 2, 122, 860 | | 2, 122, 860 |
| Rainbow trout | | 376, 840 | | 376, 840 |
| Gloucester, Mass.: | | | | |
| Cod | 1, 330, 965, 110 | 191, 980, 100 | | 1, 522, 945, 210 |
| Flatfish | | 16, 406, 280 | | 16, 406, 280 |
| Haddock | 812, 582, 500 | | | 812, 582, 500 |
| Pollock | 902, 705, 490 | 174, 382, 490 | | 1, 077, 087, 980 |
| Lobster | | 552, 000 | | 552, 000 |
| Hagerman, Idaho: | | | | |
| Blackspotted trout | | | 243, 900 | 243, 900 |
| Brook trout | | | 102, 500 | 102, 500 |
| Rainbow trout | | | 629, 300 | 629, 300 |
| Landlocked sockeye salmon | | | 531, 400 | 531, 400 |
| *Salmon, Idaho:* | | | | |
| Blackspotted trout | | | 104, 090 | 104, 090 |
| Brook trout | | 2, 060 | 4, 500 | 6, 560 |
| Golden trout | | | 11, 140 | 11, 140 |
| Rainbow trout | 1, 419, 300 | | 372, 290 | 1, 791, 590 |
| Hartsville, Mass.: | | | | |
| Brook trout | | | 301, 600 | 301, 600 |
| Rainbow trout | | | 31, 165 | 31, 165 |
| Black bass, smallmouth | | 612, 000 | | 612, 000 |
| Catfish | | | 10, 840 | 10, 840 |

*Stations and substations operated, and the output of each, fiscal year 1940*—Continued

| Stations, substations, and species | Eggs | Fry | Fingerlings | Total |
|---|---|---|---|---|
| LaCrosse, Wis.: | | | | |
| Brook trout | | | 829,410 | 829,410 |
| Lock Leven trout | | | 266,400 | 266,400 |
| Rainbow trout | | | 231,725 | 231,725 |
| Black bass, largemouth | | 21,000 | 162,390 | 183,390 |
| Catfish | | | 7,000 | 7,000 |
| Crappie | | | 9,520 | 9,520 |
| Sunfish | | | 13,700 | 13,700 |
| Yellow perch | | | 3,300 | 3,300 |
| *Bellevue, Iowa:* | | | | |
| Black bass, largemouth | | | 17,050 | 17,050 |
| Catfish | | | 108,000 | 108,000 |
| Crappie | | | 281,000 | 281,000 |
| Sunfish | | | 518,000 | 518,000 |
| Buffalofish | 42,750,000 | | 289,000 | 43,039,000 |
| Miscellaneous fishes | | | 454,000 | 454,000 |
| *Genoa, Wis.:* | | | | |
| Black bass: | | | | |
| Largemouth | | | 764,575 | 764,575 |
| Smallmouth | | | 36,490 | 36,490 |
| Catfish | | | 100 | 100 |
| Crappie | | | 40 | 40 |
| Sunfish | | | 5,320 | 5,320 |
| *Guttenberg, Iowa:* | | | | |
| Black bass, largemouth | | | 7,075 | 7,075 |
| Catfish | | | 1,726,605 | 1,726,605 |
| Crappie | | | 363,105 | 363,105 |
| Sunfish | | | 362,485 | 362,485 |
| White bass | | | 22,200 | 22,200 |
| Buffalofish | 2,822,250 | | 132,600 | 2,954,850 |
| Drum | | | 2,600 | 2,600 |
| Pike and pickerel | 6,782,810 | 740,140 | 5,510 | 7,528,460 |
| Pikeperch | 438,360 | | | 438,360 |
| Yellow perch | | | 1,950 | 1,950 |
| *Marquette, Iowa:* | | | | |
| Black bass, largemouth | | | 3,650 | 3,650 |
| Catfish | | | 480,000 | 480,000 |
| Crappie | | | 269,000 | 269,000 |
| Sunfish | | | 146,620 | 146,620 |
| White bass | | | 8,300 | 8,300 |
| Buffalofish | | | 11,800 | 11,800 |
| Drum | | | 2,800 | 2,800 |
| Pike and pickerel | | | 3,400 | 3,400 |
| Yellow perch | | | 300 | 300 |
| *Lake Mills, Wis.:* | | | | |
| Brook trout | | | 59,875 | 59,875 |
| Loch Leven trout | | | 56,500 | 56,500 |
| Rainbow trout | | | 44,200 | 44,200 |
| Black bass: | | | | |
| Largemouth | | | 88,020 | 88,020 |
| Smallmouth | | | 17,350 | 17,350 |
| Crappie | | | 6,500 | 6,500 |
| Sunfish | | | 147,500 | 147,500 |
| Lake Park, Ga.: | | | | |
| Black bass, largemouth | | | 20,800 | 20,800 |
| Catfish | | | 10,700 | 10,700 |
| Crappie | | | 391,100 | 391,100 |
| Sunfish | | | 818,900 | 818,900 |
| Lamar, Pa.: | | | | |
| Brook trout | | | 385,130 | 385,130 |
| Loch Leven trout | 10,640 | | 525,740 | 536,380 |
| Rainbow trout | | | 269,280 | 269,280 |
| Black bass: | | | | |
| Largemouth | | | 8,635 | 8,635 |
| Smallmouth | | | 7,360 | 7,360 |
| Catfish | | | 9,390 | 9,390 |
| Sunfish | | | 18,845 | 18,845 |
| *Ogletown, Pa.:* | | | | |
| Brook trout | | | 88,500 | 88,500 |
| Rainbow trout | | | 42,300 | 42,300 |
| Las Vegas, Nev.: | | | | |
| Black bass, largemouth | | | 56,000 | 56,000 |
| Sunfish | | | 18,000 | 18,000 |
| Leadville, Colo.: | | | | |
| Blackspotted trout | | | 519,665 | 519,665 |
| Brook trout | 3,824,560 | | 1,107,465 | 4,932,025 |
| Lake trout | | | 21,700 | 21,700 |
| Loch Leven trout | | | 96,110 | 96,110 |
| Rainbow trout | | | 605,170 | 605,170 |
| Steelhead trout | | | 20,580 | 20,580 |
| *Creede, Colo.:* | | | | |
| Blackspotted trout | | | 540,300 | 540,300 |
| Brook trout | 6,078,000 | | 902,900 | 6,980,900 |
| Rainbow trout | 550,000 | | 548,500 | 1,098,500 |

*Stations and substations operated, and the output of each, fiscal year 1940*—Continued

| Stations, substations, and species | Eggs | Fry | Fingerlings | Total |
|---|---|---|---|---|
| *Eagle Nest, N. Mex.:* | | | | |
| Blackspotted trout | | | 189,000 | 189,000 |
| Rainbow trout | 2,228,445 | | 277,000 | 2,505,445 |
| Leetown, W. Va.: | | | | |
| Blackspotted trout | | | 12,720 | 12,720 |
| Brook trout | | 100 | 61,590 | 61,690 |
| Loch Leven trout | | | 67,700 | 67,700 |
| Rainbow trout | 414,055 | | 189,380 | 603,435 |
| Black bass: | | | | |
| Largemouth | | | 15,065 | 15,065 |
| Smallmouth | | | 58,560 | 58,560 |
| Crappie | | | 80 | 80 |
| Sunfish | | | 3,315 | 3,315 |
| Louisville, Ky.: | | | | |
| Black bass: | | | | |
| Largemouth | | 16,650 | 12,420 | 29,070 |
| Smallmouth | | 93,700 | 4,335 | 98,035 |
| Crappie | | | 2,360 | 2,360 |
| Rock bass | | | 17,550 | 17,550 |
| Sunfish | | | 32,625 | 32,625 |
| Mammoth Spring, Ark.: | | | | |
| Black bass: | | | | |
| Largemouth | | 50,000 | 191,835 | 241,835 |
| Smallmouth | | 306,000 | 118,325 | 424,325 |
| Rock bass | | | 23,200 | 23,200 |
| Sunfish | | | 78,100 | 78,100 |
| Manchester, Iowa: | | | | |
| Brook trout | | | 191,980 | 191,980 |
| Loch Leven trout | | | 84,245 | 84,245 |
| Rainbow trout | 2,843,700 | | 143,890 | 2,987,590 |
| Rock bass | | | 12,500 | 12,500 |
| Marion, Ala.: | | | | |
| Black bass, largemouth | | 27,500 | 505,205 | 532,705 |
| Crappie | | | 3,440 | 3,440 |
| Rock bass | | | 2,035 | 2,035 |
| Sunfish | | | 1,155,475 | 1,155,475 |
| *Cohutta, Ga.:* | | | | |
| Black bass: | | | | |
| Largemouth | | 49,000 | 142,895 | 191,895 |
| Smallmouth | | 6,800 | 875 | 7,675 |
| Catfish | | | 3,000 | 3,000 |
| Kentucky bass | | 10,000 | 2,665 | 12,665 |
| Sunfish | | | 31,620 | 31,620 |
| *Lyman, Miss.:* | | | | |
| Black bass, largemouth | | | 332,990 | 332,990 |
| Sunfish | | | 840,500 | 840,500 |
| *Marianna, Fla.:* | | | | |
| Black bass, largemouth | | 17,000 | 112,545 | 129,545 |
| Crappie | | | 1,300 | 1,300 |
| Sunfish | | | 320,475 | 320,475 |
| *Tupelo, Miss.:* | | | | |
| Black bass, largemouth | | 213,000 | 397,780 | 610,780 |
| Sunfish | | | 269,215 | 269,215 |
| *Warm Springs, Ga.:* | | | | |
| Black bass, largemouth | | 4,000 | 264,125 | 268,125 |
| Sunfish | | | 4,110 | 4,110 |
| Mullan, Idaho: | | | | |
| Blackspotted trout | | 20,400 | 297,525 | 317,925 |
| Brook trout | | | 25 | 25 |
| Rainbow trout | | | 73,000 | 73,000 |
| Nashua, N. H.: | | | | |
| Brook trout | | | 158,570 | 158,570 |
| Loch Leven trout | | | 280 | 280 |
| Rainbow trout | | | 950 | 950 |
| Catfish | | | 3,000 | 3,000 |
| Neosho, Mo.: | | | | |
| Rainbow trout | 1,729,600 | | 77,405 | 1,807,005 |
| Black bass, largemouth | | 9,000 | 15,940 | 24,940 |
| Crappie | | | 44,900 | 44,900 |
| Rock bass | | | 13,500 | 13,500 |
| Sunfish | | | 12,310 | 12,310 |
| *Bourbon, Mo.:* Rainbow trout | 3,635,000 | | | 3,635,000 |
| *Forest Park, Mo.:* | | | | |
| Black bass: | | | | |
| Largemouth | | | 41,125 | 41,125 |
| Smallmouth | | | 2,700 | 2,700 |
| Catfish | | | 5,850 | 5,850 |
| Crappie | | | 11,305 | 11,305 |
| Sunfish | | | 59,550 | 59,550 |
| *Natchitoches, La.:* | | | | |
| Black bass, largemouth | | | 97,360 | 97,360 |
| Catfish | | | 875 | 875 |
| Crappie | | | 675 | 675 |
| Sunfish | | | 615,600 | 615,600 |
| Warmouth bass | | | 11,360 | 11,360 |

*Stations and substations, operated and the output of each, fiscal year 1940*—Continued

| Stations, substations, and species | Eggs | Fry | Fingerlings | Total |
|---|---|---|---|---|
| *Tishomingo, Okla.:* | | | | |
| Black bass, largemouth | | | 147, 890 | 147, 890 |
| Catfish | | | 440 | 440 |
| Crappie | | | 13, 450 | 13, 450 |
| Sunfish | | | 512, 705 | 512, 705 |
| Northville, Mich.: | | | | |
| Brook trout | | | 848, 570 | 848, 570 |
| Loch Leven trout | | | 100, 300 | 100, 300 |
| Rainbow trout | | | 309, 125 | 309, 125 |
| Black bass: | | | | |
| Largemouth | | | 6, 415 | 6, 415 |
| Smallmouth | | | 27, 400 | 27, 400 |
| Sunfish | | | 41, 690 | 41, 690 |
| *Charlevoix, Mich.:* | | | | |
| Lake trout | | | 160, 000 | 160, 000 |
| Steelhead trout | | | 22, 200 | 22, 200 |
| Orangeburg, S. C.: | | | | |
| Black bass, largemouth | | 17, 000 | 574, 110 | 591, 110 |
| Catfish | | | 23, 990 | 23, 990 |
| Crappie | | | 1, 300 | 1, 300 |
| Sunfish | | | 171, 130 | 171, 130 |
| Warmouth bass | | | 1, 685 | 1, 685 |
| Yellow perch | | | 2, 875 | 2, 875 |
| *Hoffman, N. C.:* | | | | |
| Black bass, largemouth | | | 151, 625 | 151, 625 |
| Catfish | | | 25 | 25 |
| Crappie | | | 8, 890 | 8, 890 |
| Sunfish | | | 278, 285 | 278, 285 |
| Pisgah Forest, N. C.: | | | | |
| Brook trout | | | 8, 785 | 8, 785 |
| Loch Leven trout | | | 10, 150 | 10, 150 |
| Rainbow trout | | | 21, 460 | 21, 460 |
| Pittsford, Vt.: | | | | |
| Brook trout | 119, 000 | | 64, 225 | 183, 225 |
| Rainbow trout | 94, 000 | | 8, 650 | 102, 650 |
| Put in Bay, Ohio: | | | | |
| Pikeperch | 940, 000 | 1, 250, 000 | | 2, 190, 000 |
| Whitefish | 2, 000, 000 | | | 2, 000, 000 |
| Quinault, Wash.: | | | | |
| Rainbow trout | | | 28, 460 | 28, 460 |
| Steelhead trout | | | 134, 155 | 134, 155 |
| Chinook salmon | | | 357, 070 | 357, 070 |
| Silver salmon | | | 90, 080 | 90, 080 |
| Sockeye salmon | 116, 380 | | 2, 261, 480 | 2, 377, 860 |
| *Duckabush, Wash.:* | | | | |
| Chinook salmon | | | 7, 280 | 7, 280 |
| Chum salmon | | 1, 572, 000 | 38, 620 | 1, 610, 620 |
| Humpback salmon | | 230, 790 | | 230, 790 |
| Silver salmon | | | 100, 055 | 100, 055 |
| *Quilcene, Wash.:* | | | | |
| Blackspotted trout | | | 89, 250 | 89, 250 |
| Brook trout | | | 52, 650 | 52, 650 |
| Rainbow trout | | | 600 | 600 |
| Steelhead trout | | | 130, 380 | 130, 380 |
| Chum salmon | 795, 000 | 2, 865, 680 | 90, 900 | 3, 751, 580 |
| Silver salmon | | | 509, 285 | 509, 285 |
| Rochester, Ind.: | | | | |
| Black bass: | | | | |
| Largemouth | | | 282, 095 | 282, 095 |
| Smallmouth | | | 20, 955 | 20, 955 |
| Catfish | | | 6, 575 | 6, 575 |
| Crappie | | | 2, 865 | 2, 865 |
| Rock bass | | | 94, 790 | 94, 790 |
| Sunfish | | | 572, 800 | 572, 800 |
| Yellow perch | | | 58, 070 | 58, 070 |
| Rochester, N. Y.: | | | | |
| Loch Leven trout | 65, 000 | 15, 250 | 26, 395 | 106, 645 |
| Lake trout | | | 1, 940 | 1, 940 |
| Rainbow trout | | | 37, 705 | 37, 705 |
| Black bass: | | | | |
| Largemouth | | | 16, 600 | 16, 600 |
| Smallmouth | | | 2, 500 | 2, 500 |
| *Carpenters Brook, N. Y.:* | | | | |
| Brook trout | | | 175, 350 | 175, 350 |
| Lake trout | | | 15, 000 | 15, 000 |
| Loch Leven trout | | | 14, 815 | 14, 815 |
| Rainbow trout | | | 23, 940 | 23, 940 |
| Saratoga, Wyo.: | | | | |
| Blackspotted trout | 69, 750 | 10, 570 | 502, 535 | 582, 855 |
| Brook trout | | | 117, 970 | 117, 970 |
| Loch Leven trout | | | 24, 600 | 24, 600 |
| Rainbow trout | | | 589, 285 | 589, 285 |

*Stations and substations operated, and the output of each, fiscal year 1940*—Continued

| Stations, substations, and species | Eggs | Fry | Fingerlings | Total |
|---|---|---|---|---|
| Spearfish, S. Dak.: | | | | |
| Blackspotted trout | | | 130,000 | 130,000 |
| Brook trout | 15,000 | | 326,510 | 341,510 |
| Loch Leven trout | | | 84,985 | 84,985 |
| Rainbow trout | 125,660 | | 403,125 | 528,785 |
| Springville, Utah: | | | | |
| Blackspotted trout | | | 456,600 | 456,600 |
| Brook trout | | | 210,435 | 210,435 |
| Loch Leven trout | | | 16,845 | 16,845 |
| Rainbow trout | 75,000 | | 596,995 | 671,995 |
| Black bass, largemouth | | | 1,900 | 1,900 |
| Sunfish | | | 21,000 | 21,000 |
| *Bear Lake, Utah:* | | | | |
| Blackspotted trout | | | 596,400 | 596,400 |
| Brook trout | | | 320,390 | 320,390 |
| Lake trout | | | 19,820 | 19,820 |
| Rainbow trout | | | 63,480 | 63,480 |
| Chum salmon | | | 120,680 | 120,680 |
| Uvalde, Tex.: | | | | |
| Black bass, largemouth | | 358,450 | 588,555 | 947,005 |
| Crappie | | | 50 | 50 |
| Rio Grande perch | | | 91,500 | 91,500 |
| Sunfish | | | 206,960 | 206,960 |
| *Fort Worth, Tex.:* | | | | |
| Black bass, largemouth | | | 56,840 | 56,840 |
| Catfish | | | 16,375 | 16,375 |
| Crappie | | | 13,045 | 13,045 |
| Sunfish | | | 191,795 | 191,795 |
| Warmouth bass | | | 1,300 | 1,300 |
| *Inks Dam, Tex.:* | | | | |
| Black bass, largemouth | | | 62,050 | 62,050 |
| Crappie | | | 2,925 | 2,925 |
| *San Angelo, Tex.:* | | | | |
| Black bass, largemouth | | | 317,400 | 317,400 |
| Catfish | | | 3,600 | 3,600 |
| Crappie | | | 4,400 | 4,400 |
| Sunfish | | | 461,975 | 461,975 |
| *San Marcos, Tex.:* | | | | |
| Black bass, largemouth | | 284,000 | 202,580 | 486,580 |
| Crappie | | | 300 | 300 |
| Rio Grande perch | | | 13,160 | 13,160 |
| Rock bass | | | 5,310 | 5,310 |
| Sunfish | | | 242,065 | 242,065 |
| Warmouth bass | | | 10,200 | 10,200 |
| Walhalla, S. C.: | | | | |
| Brook trout | | 50,000 | 212,490 | 262,490 |
| Loch Leven trout | | | 20,000 | 20,000 |
| Rainbow trout | | 35,000 | 85,885 | 120,885 |
| *Chattahoochee, Ga.:* | | | | |
| Brook trout | | | 33,215 | 33,215 |
| Rainbow trout | | | 38,145 | 38,145 |
| *Franklin, N. C.:* | | | | |
| Brook trout | | | 29,980 | 29,980 |
| Rainbow trout | | | 12,170 | 12,170 |
| Welaka, Fla.: | | | | |
| Black bass, largemouth | | 412,000 | 383,300 | 795,300 |
| Sunfish | | | 289,110 | 289,110 |
| White Sulphur Springs, W. Va.: | | | | |
| Brook trout | | | 45,700 | 45,700 |
| Loch Leven trout | | | 6,120 | 6,120 |
| Rainbow trout | 815,000 | | 62,025 | 877,025 |
| Woods Hole, Mass.: | | | | |
| Flatfish | 6,607,000 | 132,219,000 | | 138,826,000 |
| Mackerel | | 8,277,000 | | 8,277,000 |
| Wytheville, Va.: | | | | |
| Brook trout | | | 349,365 | 349,365 |
| Rainbow trout | 1,385,000 | | 345,650 | 1,730,650 |
| Black bass: | | | | |
| Largemouth | | | 1,860 | 1,860 |
| Smallmouth | | 19,000 | 6,150 | 25,150 |
| Rock bass | | | 5,550 | 5,550 |
| Sunfish | | | 6,275 | 6,275 |
| Pikeperch | | 300,000 | | 300,000 |
| *New Castle, Va.:* | | | | |
| Brook trout | | | 22,195 | 22,195 |
| Rainbow trout | | | 53,310 | 53,310 |
| *Harrison Lake, Va.:* | | | | |
| Black bass, largemouth | | 327,000 | 8,040 | 335,040 |
| Crappie | | | 12,845 | 12,845 |
| Sunfish | | | 209,810 | 209,810 |
| Shad | | 585,000 | 87,500 | 672,500 |

*Stations and substations operated, and the output of each, fiscal year 1940*—Continued

| Stations, substations, and species | Eggs | Fry | Fingerlings | Total |
|---|---|---|---|---|
| *Norris, Tenn.:* | | | | |
| Rainbow trout | | | 12,000 | 12,000 |
| Black bass, largemouth | | 430,000 | 22,250 | 452,250 |
| Kentucky bass | | | 25,630 | 25,630 |
| Rock bass | | | 1,520 | 1,520 |
| Sunfish | | | 82,800 | 82,800 |
| Pikeperch | | 500,000 | | 500,000 |
| Miscellaneous fishes | | | 32,000 | 32,000 |
| *Smokemont, N. C.:* | | | | |
| Brook trout | | | 98,360 | 98,360 |
| Rainbow trout | | | 79,200 | 79,200 |
| Yellowstone Park, Wyo.: | | | | |
| Blackspotted trout | 32,524,330 | 6,300,000 | 1,423,020 | 40,247,350 |
| Rainbow trout | 677,300 | | | 677,300 |
| Grayling | 4,349,000 | | | 4,349,000 |
| *Jackson, Wyo.:* | | | | |
| Blackspotted trout | | 382,000 | 224,690 | 606,690 |
| Brook trout | | 287,500 | 191,000 | 478,500 |
| Lake trout | | | 13,700 | 13,700 |
| Total | 5,826,058,990 | 1,498,156,710 | 83,031,240 | 7,407,246,940 |

## EGG COLLECTIONS

The 1940 egg collections showed a reduction in comparison with 1939 which was somewhat proportional to the reduction in hatchery output. Three marine species, cod, haddock, and flatfish, accounted for the major part of this reduction. The practice of producing trout eggs in hatcheries especially adapted to this purpose was continued, and some exchanges were effected with commercial producers. The take of brown, or Loch Leven trout eggs was increased noticeably, as the breeding stocks of this species began to attain maturity. The failure of the usual source of supply of wild brown-trout eggs several years ago forced the adoption of a policy of producing these eggs from domesticated stock. Correlation of the egg collections with the hatchery output should not be construed as an indication of mortality, since the carry-over of hatchery stock at the end of each fiscal year is a source of fish for distribution during the succeeding year.

*Comparison of egg collections, fiscal years 1939 and 1940*

| Species | 1939 | 1940 | Species | 1939 | 1940 |
|---|---|---|---|---|---|
| Shad | 48,257,000 | 51,759,000 | Grayling | 5,117,600 | 4,660,200 |
| Whitefish | 52,464,000 | 9,215,000 | Pikeperch | 966,755,100 | 10,841,400 |
| Chinook salmon | 63,124,000 | 46,059,100 | Pike-pickerel | | 8,246,100 |
| Chum salmon | 11,196,100 | 5,418,000 | Yellow perch | 301,668,000 | 245,731,000 |
| Silver salmon | 3,080,000 | 1,118,700 | White perch | 8,300,000 | 4,000,000 |
| Sockeye salmon | 2,969,000 | 2,083,300 | Cod | 3,197,555,700 | 2,838,406,000 |
| | | | Haddock | 1,178,993,700 | 1,066,164,500 |
| Landlocked sockeye salmon | | 481,900 | Pollock | 1,560,497,100 | 2,176,499,000 |
| Humpback salmon | | 686,000 | Flatfish | 1,318,397,100 | 853,782,000 |
| Atlantic salmon | | 113,000 | Mackerel | 11,060,000 | 9,102,000 |
| Rainbow trout | 30,155,900 | 33,097,900 | Lake herring | 5,325,000 | 1,245,000 |
| Blackspotted trout | 42,898,600 | 52,911,500 | Glut herring | 8,140,000 | 717,000 |
| Loch Leven trout | 899,500 | 3,043,400 | Striped bass | 3,143,000 | 8,075,000 |
| Lake trout | 2,852,000 | 1,079,300 | Buffalofish | 78,681,500 | 95,872,250 |
| Brook trout | 11,576,700 | 16,497,400 | Lobster | 12,991,600 | 8,142,500 |
| Steelhead trout | 3,386,900 | 2,477,900 | | | |
| Dolly Varden trout | | 46,000 | Total | 8,929,774,000 | 7,557,571,350 |
| Golden trout | 18,200 | | | | |

## NOTES ON OPERATIONS

### COMMERCIAL SPECIES

*Pacific salmon.*—The Leavenworth (Wash.) station and its auxiliaries are being developed for the expressed purpose of establishing the run of salmon from the upper Columbia River in tributary streams. The construction of the Grand Coulee Dam placed an insurmountable barrier to the runs of fish up the Columbia River to the uppermost spawning grounds. Since the Leavenworth unit was not sufficiently completed before the 1939 fall run to handle the adult salmon, the fish of this run were planted in waters that emptied into the Columbia River below the dam. The lower holding pond on Icicle Creek was completed in time to be stocked with chinook and blueback salmon from the spring run of 1940. These fish will be retained until the eggs mature and can be taken. The Bureau cooperated with the Washington Game Department by rearing rainbow-trout fingerlings which were received from the Big White Salmon station. The State supplied the labor necessary for their care, and the Bureau furnished the feed. The construction work at the Leavenworth station is approximately 50 percent complete. The hatchery building, which is equipped with 288 troughs, is complete. Work was started at the substations at Entiat and Winthrop, Wash. Congressional authority has not been secured and work was not begun on the proposed substation at Okanagan Falls, on the Okanagan River, B. C., where attention should be concentrated on the propagation of blueback salmon.

Owing to the abnormally low run of salmon, the Quinault (Wash.) station collected approximately 12 percent fewer eggs than last year. In 1933 the station initiated an experimental attempt to establish sockeye salmon runs in Falls Creek by planting large-size fingerling fish. At present quite extensive runs are established, and it is possible to obtain practically all the sockeye eggs required on or near the hatchery grounds. Not only does this result in an important saving, but the eggs are decidedly superior to those transported from distant points. Rather surprising results were obtained from a group of approximately 2,000 marked steelhead trout liberated in Falls Creek in November 1938 and March 1939. When liberated, these fish averaged about one-half pound in weight. During the spring of 1940, 42 of these trout were recovered in the traps. They were in fine condition and weighed approximately 4 pounds each. These trout were held for ripening in the dirt brood-stock pond without loss, and after they were spawned they were returned to Falls Creek. It has been exceedingly rare for steelhead trout to be taken in a trap in Falls Creek prior to this year. The entire output of chinook, silver, and sockeye salmon, steelhead, and rainbow trout were distributed in the State of Washington. The boathouse was moved to a new location.

The collection of chinook-salmon eggs at the Little White Salmon station this year was approximately 20 percent less than last year. Due to the lack of space, 300,000 eyed eggs were planted in the Little White Salmon River. No rearing pools have been constructed, so the output of fish was planted in the advanced-fry stage. The salmon flesh secured in spawning operations was frozen and placed in storage for future use as fish food by other stations. The new hatchery building under construction at the close of the fiscal year

1939 was completed, except for the necessary piping and troughs. Rocks were removed from the seining and trapping grounds on the river.

The Birdsview (Wash.) unit, in addition to collecting eggs from its brood stock of rainbow trout, took eggs from wild steelhead trout, silver, chinook, and humpback salmon. Chinook salmon, brook, rainbow, and blackspotted trout eggs were received from other stations. During the summer months the hatchery was operated at full capacity. All runs of Pacific coast salmon were considerably below normal during the past year.

The Carson (Wash.) station handled brook and rainbow trout as well as chinook salmon. The latter species was handled largely to relieve crowded conditions at the Big White Salmon unit. The brook trout contracted western gill disease, and the resultant loss was rather heavy. The total output of trout was distributed by the Forest Service in waters of the Columbia National Forest. The chinook salmon were liberated in Wind River, a tributary to the Columbia.

Chinook and silver salmon, and steelhead and rainbow trout were propagated at the Butte Falls (Oreg.) station. The station's water supply pipeline broke on July 6, necessitating the liberation of all hatchery fish in Butte Creek. While over one-half million more chinook-salmon eggs were taken this year than last, the total collection of all eggs handled was approximately one-third greater than for the previous year. In addition to the new 80-foot span of bridge constructed to support the hatchery water supply pipeline replacement, various minor repairs were made to buildings and equipment.

The collection of eggs at the Clackamas (Oreg.) station and its substations was slightly less than half the number collected last year. The shortage is attributable in part at least to unfavorable weather conditions and the extremely low percentage of female fish in the chinook salmon runs of Mill Creek and Battle Creek, Calif. The take of spring chinook-salmon eggs was approximately one-third the take of fall eggs of the same species. The collection of silver-salmon and steelhead-trout eggs was very satisfactory, and salmon, rainbow, brook, and blackspotted trout were propagated. Experiments with the use of chlorine in the water supply at Clackamas indicate that 0.35 part per million may be added without ill effects. Experiments were also conducted to ascertain the suitability of a new deep-well water supply to fish-cultural operations. The water was found to be relatively low in oxygen content, but it is believed that with proper aerating facilities it will be entirely satisfactory. A new hatchery building at the Delph Creek substation was completed.

The substation at Duckabush, Wash., collected eggs from more species of salmon than last year, although the total take of eggs was somewhat lower. Early- and late-run chum, silver, chinook, and humpback salmon were trapped and spawned, and the carcasses taken to the Quilcene dehydrating plant for processing into salmon meal. Due to limited pond area, most of the fish were planted as advanced fry in adjacent waters.

In addition to collecting chinook salmon eggs, the Big White Salmon substation handled brook and rainbow trout. This year's collection of salmon eggs exceeded all previous records. Even though eggs were transferred to other stations, it was necessary to plant a large number of the salmon as advanced fry. The remainder were fed until they were about 1½ inches in length, when part of them were liberated to relieve overcrowding, and the others were fed until they reached a length of about 2½ inches. The only major construction was the installation of a new water-supply line.

The Quilcene (Wash.) station and the Walcott Slough egg-collecting unit operated normally. Chum-salmon and steelhead-trout spawn was collected from wild fish, and cutthroat-trout eggs from the station brood stock. Blackspotted-, brook-, and rainbow-trout eggs were received from other sources. The collection of chum-salmon eggs was below normal. This shortage is attributed to the fact that the 1936 output of chum fingerlings was planted elsewhere than in the Walcott Slough. Satisfactory results were obtained with the use of apple flour as roughage in the food formula. Alder sawdust is now being tried in place of the apple pomace. Chum salmon were distributed as fry. The other species handled were held to relatively large fingerling size before they were liberated. The refrigeration plant under construction at the close of last year was completed, and meat grinding and refrigeration equipment was installed. All buildings were completely wired for electricity. The N. Y. A. gave much helpful assistance. In addition to making fry trays and office furniture for various units in the region, the N. Y. A. shop at Port Townsend overhauled and repainted all trucks and other machinery in need of mechanical repairs.

### MARINE SPECIES

The Boothbay Harbor (Maine) station began collecting pollock eggs in the Portland section on November 1. The collections increased until the last of November and then declined until December 15, at which date the take did not warrant the expense of further operations. During this period 1,060,000,000 eggs were taken, fertilized, and liberated on natural spawning grounds. This was an increase of 105 percent over the preceding year. In collecting cod eggs it has been the custom in past years to place spawntakers aboard the larger commercial fishing boats during the spawning season to take ripe eggs from the catch. The Bureau's boats collected the eggs on the fishing grounds, fertilized. and planted them on spawning beds. This year the commercial fishermen moved to more distant fishing grounds, thus curtailing the Bureau's operations. Fishermen aboard the vessels were employed to take the eggs, fertilize, and plant them, and one of the Bureau's spawntakers was at hand to check the take and plantings. The method was more economical than that used in the past, but it is questionable if the eggs were of the same high quality as in previous years. The cod egg-taking season began March 22 and closed June 25. The total number of eggs collected was 1,282,103,000, which was 90.3 percent of last year's record.

Haddock operations were carried on in conjunction with codfish activities. The commercial net fishermen were paid 5 cents per quart for eggs collected and planted. The first collections were made April 4 and operations continued until June 4, during which period 253,582,000 eggs were taken. Of the 681,000,000 flounder eggs secured and incubated in the hatchery, a 90 percent hatch was obtained. During June 1940, 7,532,000 lobster eggs were hatched naturally, of which 4,842,000 were assigned to the State of Maine and 2,690,000 were planted locally. Efforts are being made by the Bureau and the State of Maine to rear more of the lobsters through the fourth stage.

Propagation of pollock, cod, haddock, flounders, and lobsters was continued at the Gloucester (Mass.) station, and hatchery operations greatly exceeded those of 1939. Offshore work varied, owing to the fishermen's strike on the larger trawlers. Increased prices prevailed on all groundfish during winter and spring, thus affording an opportunity for the smaller boats to operate. It was also possible for the gill-net fleets—the main source of egg supply for the hatcheries—to operate for a longer period. Both the quality and quantity of pollock eggs and fry handled were exceptionally high. The collection of pollock eggs for the entire season totaled 1,116,498,870, of which number 213,793,370 were incubated in the hatchery and yielded 174,382,490 fry which were liberated in suitable spots in Massachusetts Bay. Immediately after fertilization, 902,705,490 green pollock eggs were liberated in offshore work. Cod operations were carried on in conjunction with the pollock activities. Hatchery work with this species was much more extensive than in previous years. Egg collections for the entire season aggregated 1,556,302,810, and of this number 227,783,930 yielded 191,980,100 fry. In offshore work 1,330,965,110 eggs were liberated on the fishing grounds immediately after fertilization. The customary small-mesh nets were not used by the gill netters during the spring season, consequently there were no collections of haddock eggs for incubation in the hatchery. Offshore activities grossed 812,582,500 haddock eggs, which exceeds last year's take by nearly one hundred million. All liberations were made in Georges Banks. Flatfish egg-collecting operations were conducted with station fyke nets again this year. From the eggs collected 16,404,280 fry were hatched and liberated on the grounds in Gloucester outer harbor, from which the eggs were secured. Several attempts were made to obtain gravid fish from other spots around Cape Ann, but it was impossible to determine the value of these undertakings as the station did not have a sufficient number of nets to properly cover the spawning grounds. The lobster-cultural work was carried on in cooperation with the Massachusetts Department of Conservation, as heretofore. In January, 62 seed lobsters were secured from the State and 15 were collected from the gill netters. From these seeders 505,470 eggs were obtained and incubated in McDonald hatching jars, and 177,000 second- and third-stage lobsters were liberated along the Massachusetts coast from Newburyport to Boston. There were also 375,000 young lobsters liberated in July 1939 from eggs on hand at the termination of the fiscal year 1939, making the total liberations for the current year 552,000. As the station was completely rehabilitated last year under the auspices of the P. W. A. and W. P. A. projects, no major construction work was necessary. However, minor repairs were made to station buildings and equipment, both floating and automotive.

Flounder operations were begun in the Woods Hole (Mass.) area on January 3, when three fyke nets were set in Waquoit Bay. The number of nets was increased as conditions warranted until 24 nets were in use. Although a catch of only 435 suitable spawners was obtained, which is approximately one-fifth of the average take of previous years, they produced 156,378,000 eggs. From this number

132,219,000 fry, 3,684,000 eyed eggs, and 2,923,000 green eggs were planted. As the planting of flounder fry in Long Island Sound and Narragansett Bay has produced good results, a portion of the production was liberated in those waters. Most of the remainder was planted in the coastal waters of Massachusetts, and a limited number were assigned to the Rhode Island Fish and Game Commission. From commercial fishermen 9,102,000 mackerel eggs were obtained which produced 8,277,000 fry for liberation in Vineyard Sound and Buzzards Bay.

### GREAT LAKES SPECIES

The role of hatcheries in maintaining the supply of commercial species in the Great Lakes is a highly debatable issue. Commercial fishermen generally advocate more hatchery activities, although their cooperation in supplying eggs is not fully satisfactory. It is pointed out, in opposition, that the decline in abundance of whitefish, lake trout, and lake herring continued during the years when hatchery activities were at their peak. There has been no clear determination of the relative efficiency of natural versus artificial reproduction in this field. It is clear, however, that the salvaging of mature eggs from fish caught during the open fishing season is a contribution to the industry, and the hatcheries operate on this basis. Also, there is evidence that the rearing of lake trout to fingerling size before planting, as is done at the Charlevoix (Mich.) station, will give more positive results.

Due to the fact that waters in which the Duluth (Minn.) station collects lake-trout and whitefish eggs were closed to fishing during the spawning season of both species, the take of these eggs was light. About 801,200 green lake-trout eggs were collected, 7,404,800 eyed eggs were received from the Michigan Department of Conservation, and 400,000 eyed eggs were obtained by transfer. The whitefish eggs taken were of poor quality and the hatch was only about 50 percent of normal. An effort was made to persuade the herring fishermen to take eggs from their catches, but little cooperation was secured. Pikeperch eggs were collected in cooperation with the Forest Service, and although the take was normal the quality of the eggs was slightly lower than for previous years. The majority of the fry were distributed in the waters of Superior National Forest. During these operations 230,000 northern-pickerel eggs were taken for experimental incubation and approximately 87 percent hatched, which demonstrates that this species can be successfully propagated artificially. Brook-, brown-, and rainbow-trout eggs were received by transfer and hatched for general distribution and for stocking the Cascade rearing ponds in Superior National Forest.

The Cape Vincent (N. Y.) station, due to a lack of funds and poor fishing weather during the height of the spawning season for lake trout, was able to secure only 278,000 eggs. When eyed, 234,500 of these eggs were shipped to Peru for the stocking of Lake Titicaca. A shipment of 300,000 lake-trout eggs was received by transfer from Duluth, Minn., to replace those sent to Peru. A total of 6,335,000 whitefish eggs were received from local fishermen, and the resultant fry were planted in Lake Ontario. The lake-herring eggs secured from commercial fishermen were few and of poor quality, but such fry as were obtained were released in Lake Ontario. The station's production of trout and pondfishes is discussed under the heading "Trout and Pondfish Stations."

### ANADROMOUS SPECIES, ATLANTIC COAST

At the Fort Belvoir (Va.) unit, the take of shad eggs was substantially increased. Due to favorable water temperatures throughout the season, the hatch was 95.7 percent. The fry, with the exception of 3,000,000 which were assigned to the Conservation Commission of Maryland for planting in streams tributary to Chesapeake Bay, were planted in the Potomac River. Collection of yellow-perch eggs fell off slightly, although more than 243 million were taken. Of these, 41,124,000 were transferred to the hatchery for incubation and the remainder were placed in wire hatching baskets and incubated in natural waters. When the fry reached the free-swimming stage they escaped from the baskets. The benefits derived from planting yellow perch in suitable localities is well illustrated by the results obtained in the Wicomico River in Maryland. This river and its tributaries have been stocked with yellow perch fry annually since 1937, and a Maryland Conservation Commission inspector reports the following results: The first fish appeared in commercial quantities in 1939, when a catch of 75 barrels was reported "where none had been taken for years before." In 1940 it was reported that "as much as 3,500 pounds were caught in nets in 1 day in the upper Wicomico River * * * ."

The Edenton (N. C.) station propagated four anadromous species of the Atlantic coast. Although the cold winter and late spring caused a delay in the run of fish, and the late freezing of the rivers and Albemarle Sound destroyed so many of the stakes of the Dutch-net fishermen that new settings were necessary, slightly over 1¾ million yellow-perch eggs were collected and approximately 1⅓ million fry were produced. Because the shad run started much later than usual, the North Carolina Department of Conservation and Development extended the fishing season 5 days to compensate. This was a distinct aid to the hatchery, as the warmer water at the close of the season appreciably increased the number of ripe fish taken. The total shad-egg collection was almost double last year's, and 13,600,000 fry were planted in Albemarle Sound and its tributaries. About 200,000 fry were held in the rearing pond for continued tagging experiments. A number of tagged shad released at the Skinner's Point Fishery in May 1939 were taken within 4 miles of the point during the spring. Study is being made of reports that the shad run in Albemarle Sound all summer. More than 4,000,000 white-perch eggs were taken in Washington County, across Albemarle Sound, and the fry were planted in waters near the hatchery. When the ponds were drained for removal of pondfish, a number of white-perch fingerlings were found. These were planted in a local pond, as an experiment to study the ability of the white perch to adapt itself and propagate in landlocked waters.

The Weldon (N. C.) hatchery was operated from May 1 to May 20 for the collection and hatching of striped bass. Although runs of these fish were considered below normal, the collection was about two and one-half times greater than last year, and 5,917,000 fry were planted in Roanoke and Tar Rivers. The results of herring-egg collections were only partly successful, due to the inexperience of the spawntakers, and only 170,000 fry were liberated in local waters.

The Harrison Lake (Va.) hatchery cooperated with the Virginia Commission of Game and Inland Fisheries in setting up batteries for hatching shad on the Chickahominy River near Holdcroft, on the Pamunkey River at the Pamunkey Indian Reservation, and on the Mattaponi River at the Mattaponi Indian Reservation. All equipment for these stations was supplied by the Harrison Lake hatchery and operated by the Commission of Game and Inland Fisheries. These units produced 2,827,000 shad fry, and the Harrison Lake station produced 585,000 fry and 87,500 fingerling shad.

### GAME-FISH PROPAGATION

The fact that sport fishing is growing more popular yearly is definitely indicated by an increase of approximately 6 percent in the number of fishing licenses purchased in 1938-39 over the season of 1937–38. It is estimated, including those who are not required to have licenses, that the total number of persons who enjoyed the sport of angling in 1938–39 was probably about 12,000,000. To meet this increasing demand the Bureau of Fisheries is expanding fish production as rapidly as funds permit. In addition to enlarging the existing units, several new hatcheries are being constructed in various sections. The Bureau, through the Division of Scientific Inquiry, is continually studying the environmental factors detrimental to the growth of fish. Such problems as the effects of pollution, flood and drought, and natural food supply are being investigated and programs formulated for managing game fish of the inland waters so as to benefit the largest possible number of anglers. The following reports of the year's activities at individual stations gives an accurate picture of the efforts being made to accomplish this end.

### ROCKY MOUNTAIN TERRITORY

A number of new collecting fields were operated by the station at Leadville, Colo., resulting in an encouraging increase in the number of eyed eggs shipped to other stations and a slight increase in the number of fingerlings distributed. Seven species of trout were distributed. Several of the station buildings were painted, and the foreman's cottage was remodeled.

The unit at Creede, Colo., operated a new field unit for taking eggs at Electra Lake, near Durango. More than 2 million rainbow trout eggs were collected from this lake, and the total take of rainbow and brook trout eggs was more than 5¼ million. Including eggs collected, eyed, and hatched on a cooperative basis, and eggs received by transfer, this unit handled a total of approximately 15¼ million trout eggs. Much of the distribution was performed by other conservation agencies cooperating with the hatchery.

The Eagle Nest (N. Mex.) unit is operated on a seasonal basis. Due to the long winter season it is impractical to produce fish larger than the fingerling stage. Approximately 3¼ million eggs were collected from wild rainbow trout. Almost two-thirds of the eyed eggs were transferred to other stations and to the New Mexico Department of Game and Fish. The hatch of blackspotted and rainbow trout was entirely satisfactory.

In Utah the Springville unit distributed 1¼ million fingerling and adult fish. The take of rainbow-trout eggs was only about one-half the number collected last year, consequently fewer eyed eggs were shipped to other stations. Approximately 1 million rainbow-trout eggs were incubated. In addition brook, Loch Leven, and black-spotted trout were hatched and distributed. Between 45 and 50 percent of the trout produced were allotted to national forests and national parks. The limited area of the ponds restricted the production of warm-water fish to 2 species, largemouth black bass and sunfish, and 9,542 fingerlings were harvested per acre during the fall of 1940. Twenty new troughs, which were constructed last year, were installed in the hatchery.

The substation at Bear Lake, Utah, propagated four species of trout, and more than 1 million fingerlings were distributed. Blackspotted- and rainbow-trout eggs were collected from wild fish trapped in tributaries to Bear Lake. Since only one trap was operated this spring, the take of eggs was considerably less than last year. Lake- and brook-trout eggs were received by transfer, and the fingerling chum salmon which were carried over from last year were planted in the Hyrum and Pineview reservoirs.

Because of unfavorable conditions at the former Glacier Park unit, the National Park Service secured a new site near Creston, Mont. The equipment was moved to the new Glacier National Park Station and temporarily installed to enable production of fish to continue while the hatchery building and ponds were being constructed. All brook and rainbow trout hatched were held as a nucleus for future brood stock. The Bureau assumed complete charge of construction on December 1, 1939, and the work was prosecuted, under a P. W. A. grant, with W. P. A. labor. At the close of the fiscal year the cottage, utility building, hatchery building, and water-supply system were completed. The landscaping, fencing, and other minor projects, are only partially complete. In addition to the 24.5-acre brood-stock pond, 23 rearing ponds were completed and 6 are in use. It is planned to propagate blackspotted, brook, and rainbow trout, and grayling, when this station reaches full production.

Owing to an outbreak of furunculosis, all the brook trout at the Saratoga (Wyo.) station were disposed of. The water supply was treated with chlorine, followed by derris root, and there has been no evidence of the return of this disease. More than 3 million black-spotted-, brook-, Loch Leven, and rainbow-trout eggs were incubated. Four new concrete ponds 60 by 6 feet were built, posts were set, and wires were strung to keep out predatory birds. Remodeling of the superintendent's house was about 50 percent completed.

The Jackson (Wyo.) station was operated during the entire year. Blackspotted, brook, and lake trout were propagated. Since no brood stock are kept, and no wild eggs are collected, all eggs are received by transfer from other Federal and State hatcheries. The fish were distributed by the National Park Service and the Forest Service in the waters of the Grand Teton National Park, and the Teton National Forest. More than 1 million fish were distributed, and approximately one-half million fish were on hand on June 30, 1940. The C. C. C. maintained a camp at that station until December 18, 1939, under the direct supervision of the Forest Service. The personnel of the camp was engaged in various activities such as landscaping grounds, grading pond banks, and painting buildings and equipment. These additions materially increased the capacity and efficiency, and enhanced the appearance of the property.

The Las Vegas (Nev.) unit reports a substantial increase in the output, even though weather conditions were extremely unfavorable during the bass-spawning season. The recurrence of high winds and extreme temperature fluctuations caused large numbers of the bass to leave the nests after the eggs were deposited. The consequent delay in completion of spawning resulted in retarded development which postponed much of the distribution until after June 30. Sunfish production was very satisfactory. Bass production was 7,000 and bream 20,000, per acre. A shortage of water is reported, due to decreased flow of the two artesian wells.

The cooperative substation at Mullan, Idaho, received the major portion of its eggs from the Idaho Fish and Game Department. Trout began spawning much earlier in this region than last year, and better results are expected from all lots of eggs handled. Rainbow and blackspotted trout were propagated. All fish were planted in Shoshone County, in the Coeur d'Alene and St. Joe National Forests, by the Idaho Fish and Game Department in cooperation with the U. S. Forest Service and the C. C. C.

The Hagerman (Idaho) station made some changes in fish-cultural practices. Feeding formulas and methods were modified with the rainbow-trout brood stock, which resulted in a larger take of superior eggs. Although fish resulting from domestic eggs show a larger loss in the sac stage than those from wild eggs, the growth of the former is decidedly more rapid. More than 1½ million fingerlings and adults were planted during the year and there are on hand slightly more than 2¼ million fingerlings and one-half million eggs. Rainbow trout is the only species held as brood stock, but brook and blackspotted trout and sockeye salmon (landlocked) eggs were received by transfer and hatched.

The Sun Valley (Idaho) substation was operated from April 1 to May 18 for the collection of rainbow-trout eggs. A W. P. A. project included the grading of 1 mile of road to connect with the county road with 2 bridges. The W. P. A. also completed 3 new rearing ponds which have a carrying capacity of one-half million fingerling trout to the 3-inch stage. Development of a 5-acre park is about 30 percent complete.

The Salmon (Idaho) station propagated rainbow, brook, blackspotted, and golden trout. Rainbow-trout eggs were collected from Williams Lake, and the other species were received as eyed eggs. Although fewer green eggs were collected this year than last the resultant number of eyed eggs was only slightly less, since extra care exercised in the selection of spawners, fertilization, and transporting eggs to the hatchery resulted in an average of 90 percent eyed eggs as compared to an average of only 66 percent in 1939.

The Bozeman (Mont.) station had an unusually successful year. The loss of fry and fingerlings was very small and growth was excellent. The 3-year-old rainbow trout brood stock spawned to a limited extent this year. Rainbow, brook, brown, and blackspotted trout eggs received from other Federal and State hatcheries, and 300,000 eyed Montana grayling eggs were received from the Yellowstone Park station. Hatching and feeding of this species proved successful, as a total of 252,550 fingerling graylings were distributed—approximately one-seventh of which were 5 to 6 inches in length. Distribution was carried out in cooperation with the Forest Service, the National Park Service, the Indian Service, the Montana Fish and Game Commission, and private agencies.

The total output of the Ennis (Mont.) substation was approximately 2½ million, and the collection of rainbow-trout eggs was slightly greater than last season. Fry from the station brood stock were stronger and faster-growing than fry resulting from eggs collected from wild rainbow trout. There was also an increase in the take of Loch Leven trout eggs from wild fish. No Montana grayling were hatched this year and the grayling carried over from 1939 were all planted. Many needed improvements and additions were made by W. P. A. workers. Extensive landscaping of hatchery grounds, construction of 2 ponds for brood stock, graveling of roads, construction of rock terraces, flagstone walks, and painting of buildings were the major accomplishments.

Harvesting the fingerling crop at the Miles City (Mont.) pondfish station was begun in September and completed in November. The yield was entirely satisfactory, resulting in a net increase of slightly more than 20 percent over last year. Five species of warm-water fishes were propagated. The brood stock came through the winter with practically no loss except to the channel catfish, practically all of which disappeared. Two holding ponds below Lake Garberson and a 2-acre pond were completed with W. P. A. labor. Two concrete pools were constructed on the station lawn for display purposes, and stocked with specimens.

Unsettled weather at spawning time in 1939 caused fewer fish to be carried over for fall delivery at the Dexter (N. Mex.) station. About one-ninth of the fish distributed were from 5 inches in length to legal size. Six species of warm-water fishes were propagated, with an average of 5,886 fish per acre. Two ponds were completed and an artesian well was drilled to augment the station water supply.

There was a marked increase in production at the Santa Rosa (N. Mex.) unit, but the total capacity for bass was not reached. The production of green and bluegill sunfish was slightly more than double the combined output of largemouth black bass, smallmouth black bass, and catfish. Fifteen local ponds were stocked on a cooperative basis. Quite a number of the smallmouth black bass which were introduced into this section 2 years ago have been caught recently by sportsmen. The construction of a garage and storage room was completed, a new pond was excavated, and the pond levees were riprapped at all necessary points.

The production of the Elephant Butte (N. Mex.) station was very gratifying. There was an increase in the output of approximately one-fourth million over last year. The problem of predatory bird control appears to have been satisfactorily solved by stretching wires above the pools at intervals of 25 feet. The experimental feeding of ground carp and other rough fish to bass fingerlings gave very satisfactory results. Not only do the fish make more rapid growth, but cannibalism is greatly reduced. Extensive repairs were made to the roads and dykes.

The Spearfish (S. Dak.), unit maintains brood stock of both brook and rainbow trout. This year's egg collections were below normal, due to an excessive number of barren females among the rainbow brood stock. Station records indicate that the temperature of the water supply is gradually rising. The barren females and surplus males were culled from the brood stock and released in public waters. Blackspotted and Loch Leven eggs were received by transfer. The State hatchery at Rapid City filled numerous Forest Service applications for nearby waters and the Bureau filled State applications for the stocking of waters in close proximity to the Spearfish station. Two ponds are being completely rebuilt by W. P. A. labor. The drainage channel was extended 176 feet to afford a bypass for upper ponds to avoid running all waste water through a lower series. The roadways were widened and repaired.

No brood stocks are maintained at the Spokane (Wash.), substation and no eggs were collected from wild stock. From eggs received from other hatcheries a normal output was obtained. The fish were distributed by the Washington Department of Game, chiefly in the waters of Spokane and adjacent counties.

The unit in Mount Rainier National Park collected no eggs this year, as the rainbow-trout brood stock were not sufficiently developed to spawn. Rainbow, brook, and blackspotted trout were handled. Due to the low temperatue of the water supply, very little dry feed can be used. Practically the entire production was planted by the Park Service in waters of the Mount Rainier National Park.

The seasonal substation at Baker Lake, Wash., was operated from July 1 to September 17. Blackspotted-trout eggs were received from the station in Yellowstone National Park, and an excellent hatch was secured. Brook- and rainbow-trout fingerlings were received by transfer. The Forest Service transported and planted practically the entire output within the boundaries of the Mount Baker National Forest. In addition to hatchery operations, salmon were captured and planted in Baker Lake and its tributaries. The Baker River sockeye salmon run appears to be increasing.

The output of the Clark Fork (Idaho) station was increased more than 135 percent over the production for the preceding year. Dolly Varden trout were propagated in addition to the four species previously handled. The landlocked sockeye salmon and the Dolly Varden trout eggs were taken from wild stock trapped on Bull Creek and Spring River by the Idaho Fish and Game Department. Approximately 1½ million trout and salmon were produced. The major portion of the distribution was accomplished through cooperation with the Fish and Game Department of Idaho, and the Forest Service.

## NEW ENGLAND TROUT STATIONS

The Hartsville (Mass.) unit handled brook and rainbow trout and two species of pondfish during the year. The first-year spawning brook trout produced 118,700 eggs which were supplemented from other hatcheries. Rainbow-trout eggs were received from the Leetown (W. Va.) station. Smallmouth black bass fry were collected from Wangum Lake, Conn., in cooperation with the Connecticut State Board of Fisheries and Game. Adult catfish were trapped from Willetts Pond, near New Marlboro, Mass., and distributed to applicants or planted in adjacent waters. Six cooperative trout-rearing nurseries were furnished trout and periodical inspections were made of such units during the season for the purpose of furnishing technical advice to the cooperators.

Four species of trout were handled by the East Orland (Maine) hatchery. The take of green eggs from the station's brook-trout brood stock was 4,569,985, of which 3,200,000 eyed eggs were shipped to other Bureau stations. Lake-trout eggs were received from the Cape Vincent (N. Y.) station, and rainbow-trout eggs from the Neosho (Mo.) unit. Approximately 5,000 rainbow-trout fingerlings are being held for future brood stock. The State of Maine Department of Inland Fisheries and Game and the Salmon Club of Bangor cooperated in the collecting and transporting of wild Atlantic salmon to the hatchery for spawntaking. Twenty-five fish were collected, and from 11 of these 113,000 green eggs were taken. An attempt is being made to collect salmon from a fish trap installed at the up-river end of the fishway at the Bangor dam and hold them for future spawning. The trap was installed in June 1940 and a number of salmon have been taken.

Rainbow, brook, and brown trout and catfish were handled at the Nashua (N. H.) hatchery. Dry feeds were successfully used, and trout were produced much more economically. The repair of the station property which was damaged by a hurricane last year was almost completed. W. P. A. labor cut and yarded approximately 300,000 board feet of white pine logs, and slightly more than half the logs had been sawed into lumber by the close of the fiscal year. One carload of the lumber was shipped to the station at Craig Brook, Maine. There also was approximately 400 cords of wood cut from the tree tops and limbs.

Due to an infestation of furunculosis in 1939, all the brood stock at the National Forest (N. H.) station was disposed of and it was necessary to secure eggs from another source. One million brook-trout eggs were purchased from a commercial hatchery, from which a hatch of 96.9 percent was obtained. No further loss was sustained from furnunculosis, but some sac fry were lost from whitespot disease. Further loss occurred in June, due to octomitis which readily responded to treatment. Fry, fingerlings, and yearlings were distributed in the States of Maine, New Hampshire, and Vermont. There was very little expense connected with the distribution, as the fish that were not called for by applicants were distributed by fish and game departments. Under the auspices of the W. P. A., many needed repairs and improvements were made to buildings and ponds.

The fish-cultural activities of the St. Johnsbury (Vt.) unit were carried on in close cooperation with the Fish and Game Service of Vermont. Brook-trout eggs were hatched and distributed in the fry stage. The output of brook-trout fry was somewhat less than in previous years, but this was offset by the increase in the number of brown trout and landlocked salmon handled. Smallmouth black bass fry were received from the Hartsville (Mass.) station and placed in rearing ponds for subsequent distribution. The brown-trout and landlocked-salmon eggs handled were collected from wild fish by the Vermont Fish and Game Service.

The Pittsford (Vt.) station handled brook and rainbow trout. A sufficient stock of brook-trout brood fish is held to assure a minimum production of 50,000 fingerlings for distribution. Very satisfactory results are reported on the selective breeding for increased egg production. Reports on this and other investigation activities appear in the reports of the Division of Scientific Inquiry.

The Cortland (N. Y.) hatchery does not maintain a brood stock, and all eggs handled were received from other stations. Brook, brown, rainbow and lake trout were propagated, and the results obtained were gratifying. Under the auspices of the N. Y. A. and W. P. A., extensive repairs and improvements were made to buildings, roads, and grounds. Summaries of the experimental activities and scientific investigations appear elsewhere.

The Carpenters Brook unit, which is operated in cooperation with Onondaga County, collected eggs from its brood stock as follows: 100,140 brook-trout, 147,750 brown-trout, and 14,630 rainbow-trout and 199,670 brook-trout eggs, and 35,000 lake-trout eggs were received from other stations. Approximately 75 percent of the resulting fish were distributed as fingerlings, and the remainder are being held for liberation as yearlings.

### COMBINATION TROUT AND PONDFISH STATIONS

No trout eggs were taken at the Lamar (Pa.) hatchery this year. Eggs received from other points produced 1,180,150 trout, and approximately 400,000 of these fish were transferred in the small fingerling stage to the Ogletown and Alleghany National Forest substations and cooperative nurseries where they are to be fed until late fall and liberated in public waters. In addition to trout, the Lamar hatchery propagated 5 species of warm-water fishes—comprising largemouth and smallmouth black bass, yellow perch, catfish, and sunfish. The aggregate output of pondfishes was 44,230 fingerlings. This unit has 15 completed ponds, each approximately 1 acre in area, and 3 under construction. Ponds were excavated and other improvements were made under the auspices of the W. P. A. and the C. C. C., and N. Y. A. employees also assisted with the general work.

The Flintville (Tenn.) station received rainbow-trout eggs from the White Sulphur Springs (W. Va.) hatchery. In addition to 179,200 3- and 4-inch fingerling rainbow trout for the stocking of Alabama, Georgia, Ohio, and Tennessee waters, 34,000 fingerlings were on hand at the end of the year. Largemouth black bass, smallmouth black bass, rock bass, and sunfish also were propagated. However, due to the small pond acreage available for the culture of warm-water species, the output of most of these forms was relatively small. Several thousand black bass and sunfish were received from the Marion (Ala.) hatchery and distributed for the stocking of central Tennessee waters. The successful artificial hatching of red-horse-sucker eggs engendered enthusiastic interest by the fishermen of this area.

The Powder Mill Park (N. Y.) hatchery, which is operated in cooperation with Monroe County, maintained a stock of adult trout from which sufficient brook-, brown-, and rainbow-trout eggs were collected to meet its needs. In addition to these three species, lake trout also were handled. This station reared practically its entire output of trout to yearling size before releasing them in the waters of Monroe County. Only 2½ acres are available for the culture of pondfishes, yet 16,600 largemouth and 2,500 smallmouth black bass fingerlings were produced.

At the Manchester (Iowa) unit 206,400 more rainbow-trout eggs were taken than last year, even though a shortage of water caused the loss of a number of brood fish before spawning. Of the 3,198,400 green eggs taken, 94 percent eyed. Only 172,000 of these eggs were held at the hatchery. The brook trout resulting from eggs received from another hatchery were infected with western gill disease and required constant treatment. Brown-trout eggs were received from the Michigan Department of Conservation. The smallmouth black bass failed to spawn normally and consequently the output was small. Arrangements have been made to secure new brood stock for next year. The rock bass produced a normal crop. The area for the production of pondfish is very limited, only 2.13 acres being available.

At the Leetown (W. Va.) station a total of 1,363,600 rainbow-trout eggs and 270,600 brown trout eggs were taken. The low hatch of trout eggs was attributable to dietary deficiency. During the year 189,380 rainbow trout, 61,690 brook trout, and 67,700 brown trout were distributed, and 32,370 trout of 6 inches or more in length were furnished to the George Washington National Forest. Approximately 58,560 smallmouth black bass were distributed direct to applicants or transferred to Wytheville and New Castle, Va., for supplying applicants in these sections. Artificial feeding of smallmouth black bass was carried on in 8 of the new ponds. These fish exceeded the growth of bass produced on natural food; in some cases by several inches. Experiments with blackhead minnows as forage fish showed that the production of smallmouth fingerling bass was in reverse proportion to the number of adult forage minnows used.

The Lake Mills (Wis.) station is not equipped to maintain a stock of brood trout. Brook-, brown-, and rainbow-trout eggs were received from other hatcheries and the resultant fish were distributed in waters of Wisconsin, Michigan, and northern Illinois. This station has a pond area of 29 acres, with 35 ponds available for the production of warm-water fishes. Largemouth and smallmouth black bass, crappie, and sunfish were propagated. There were approximately 8,940 pondfish produced per acre, or a total output of 259,370 fingerlings.

The Northville (Mich.) hatchery produced both trout and pondfishes, in addition to supervising the propagation of lake trout and steelhead trout at the Charlevoix substation and the rearing of trout at cooperative nurseries in the Marquette National Forest (Sullivan Creek), Huron National Forest (Pine River), Clare County, and the Fontinalis Club. The trout were transferred from the Northville Station to the nurseries by Fisheries Car No. 9 during the early part of May. Rainbow- and brook-trout eggs were received from other Bureau stations while the brown-trout eggs were supplied by the Michigan Department of Conservation. In addition to the trout work, three species of pondfishes were propagated. About 27,400 smallmouth black bass, 6,415 largemouth black bass, and 41,690 sunfish fingerlings were distributed. These fish were produced in 4.8 acres of water, which is the total acreage available for the culture of warm-water fishes.

The take of rainbow-trout eggs at the Neosho (Mo.) unit was slightly less than for the last year because approximately 1,000 2-year-old females failed to reach maturity. Selective breeding was practiced, and no eggs were retained to hatch for brood stock except from females producing approximately 1,300 eggs per pound of fish, which eyed 90 percent or more. Trout eggs were shipped to a number of Bureau stations. The number of warm-water fishes produced was limited by the small amount of available pond area (6.776 acres). Due to unseasonable weather which previled during the spawning season, the bass production was unusually small. The schools of bass fry apparently broke up much younger this year than usual because of high winds during the hatching season. The total output of all sizes of bass for the year was 24,940.

The cooperative substation at Bourbon, Mo., materially increased its production of rainbow-trout eggs, and 91 percent of the green eggs taken were eyed.

The production of trout from the Cape Vincent (N. Y.) station and its auxiliaries at Cortland, Watertown, and Barneveld, was approximately 1¼ million, several thousand of which were of legal size. The activities with pondfish were confined entirely to the propagation of smallmouth black bass, with an output of this species in excess of 150,000 fingerlings—an increase of more than 60 percent over last year's production.

### APPALACHIAN AND BLUE RIDGE TROUT STATIONS

The Pisgah Forest (N. C.) station, which is located on the Davidson River in the Pisgah Forest and operated in cooperation with the Forest Service, liberated its production in waters within the Federal area in which it is located. The various waters were stocked in accordance with a program formulated on data collected from stream surveys made by the Division of Scientific Inquiry. It was very difficult to hold the trout over the winter, as the temperature of the water remained at 32° F. for several days, causing as much as 6 inches of ice to form on the ponds during a single night.

The Smokemont (N. C.) hatchery, which is located in the Great Smoky Mountains National Park, reported a production of 177,560 brook and rainbow trout ranging in length from 3 to 6 inches. These trout were utilized in restocking waters of the Great Smoky Mountains National Park and the Cherokee Indian Reservation. The present water-supply system at Smokemont is unsatisfactory for fish-cultural purposes and the National Park Service has under consideration the construction of an open flume, or raceway to replace the present metallic underground pipe. In the meantime, it is the intention to incubate some trout eggs during the coming season at the Walhalla (S. C.) hatchery, and transfer the resulting fish to Smokemont when they are approximately 1 inch long.

The output of rainbow, brook, and brown trout at the Walhalla hatchery was in excess of 400,000. While 52,445 of these fish were assigned directly to the Forest Service, 231,000 were transferred to the Nantahala and Chattahoochee National Forest rearing units where they were held until fall before being liberated in the streams of those two public areas. At the end of the year, approximately 500,000 fingerling trout of the three species handled were on hand at Walhalla.

The majority of the fish produced in all of the trout hatcheries and rearing units in this area are now being planted according to a carefully planned program. Game-fish management is undergoing a broad-scale trial in this region where the fishing pressure is relatively intense. The results to date have emphasized a dependence upon hatcheries and the necessity for rearing the fish to legal size.

## PONDFISH STATIONS

Probably a larger percentage of sportsmen are dependent upon the warm-water fishes for recreation than upon any other group. Increasing temperatures of the inland streams, due to deforestation, decreased flowage of water, etc., have rendered many which formerly produced cold-water fishes too warm for their continued survival. The stocking of such waters has placed an additional drain upon the production of pondfish hatcheries. To produce fish for these waters, as well as newly created ponds, lakes, and reservoirs, the Bureau is adding new units in various sections of the country and increasing the size of existing hatcheries as rapidly as funds for such operations are provided. Although progress is being made in the study of artificial feeding of pondfishes, no artificial ration has been found that successfully supplants the natural diet. Therefore, the production of pondfishes is still largely dependent upon the area of the ponds available, which ponds must synthesize a supply of food sufficient for their growth to the desired size. Supplementing the natural food production to a certain degree has helped to meet the problem.

The Fairport (Iowa) hatchery conducted its fish-cultural activities along routine lines, and attained normal success in the production and distribution of six species of spiny-rayed fishes. Buffalo-fish eggs amounting to 50,300,000, obtained from commercial fishermen operating along the Mississippi River in the vicinity of the station, were fertilized and returned to the spawning grounds. Very little salvage work was necessary along the Mississippi River, but since this unit is properly equipped to handle such operations it cooperated with local sportsmen and the Iowa Conservation Department in transferring game fish and pan fish from stagnant inland waters to suitable nearby waters.

Due to adverse weather conditions during the spawning season, the production of largemouth black bass at the Rochester (Ind.) station was far below that of last season. Nevertheless, the total output of the eight species of warm-water fishes handled at this hatchery and its auxiliary at Argos was in excess of 1 million fingerlings. This station was favored with a W. P. A. project which made possible regrading several pond bottoms and banks, riprapping approximately 16,000 square feet of creek bank, landscaping grounds, and excavating a 5-acre pond. Cattle manure was used for fertilizer, and the production of daphnia for fish food was quite successful; especially during the early spring months. The nine flowing wells—the source of water supply at the Argos unit—were cleaned, thus increasing the flow of all wells except one by approximately 50 percent.

The Senecaville (Ohio) substation was opened on May 7 and shortly thereafter 74,000 advanced black bass fry were transferred from Rochester to that point for stocking the rearing ponds.

Although the Welaka (Fla.) station has not been placed on a full productive basis, the output of black bass and bream for the year was in excess of 1 million—this production being the largest since the station has been under the jurisdiction of the Bureau. Approximately

460,000 of the output were assigned to the Ocala National Forest for restocking waters in that public area. Improvements were made to the station under the auspices of the W. P. A. as follows: Completed drainage system for the series of 24 one-acre ponds; installed 30-inch drain in Beecher holding lake; regraded bottoms of ponds, including Beecher holding lake; removed obsolete water system; installed laboratory heating system; and numerous minor repairs to buildings.

Compared with last year's total output at the Uvalde (Tex.) unit, there was a total reduction of 13 percent, with an increase of approximately 26 percent in the production of largemouth black bass. These differences were due to an emphasis on bass production which resulted in tripling the output of this species in comparison with other varieties. Approximately 1⅓ million fish were distributed, including 206,700 fingerling sunfish and 91,400 Rio Grande perch. In addition to the above, a total of 480 adult brood stock were assigned to the new unit at Inks Dam, Burnet, Tex. The extremely unfavorable weather conditions prevalent at many of the hatcheries during the spawning season of the bass was not experienced at Uvalde.

The production of the two species propagated at the Burnet hatchery was entirely satisfactory. The year's yield of largemouth black bass was 19,390 per acre of water, and the production of crappie was 3,655 per acre. A total of 64,975 fingerling fish were produced. Construction and painting of all station buildings, including residence, garage, office, and bachelor quarters, shop-garage, and fish-holding house were completed. The grading and landscaping of the building area was completed and water lines for sprinkling were installed. The hatchery grounds were enclosed with a woven wire fence and cattle guards were constructed at the more important entrances. Although all 14 ponds are completed, a number remain to be treated to reduce seepage.

Owing to intensive daphnia culture and artificial feeding, the San Marcos (Tex.) unit was able to effect a substantial increase in the production of fingerling fish; even though the pond area of approximately 12½ acres was not increased. Two or more species are produced in each of a number of the ponds. The maximum per-acre production of fingerling fish at this hatchery was achieved with bream, at 80,000, followed by largemouth black bass at 51,000.

The San Angelo (Tex.) station, which has a pond area of 45 acres, produced more than 787,000 black bass, sunfish, channel catfish, and crappie, all of fingerling size. No major construction work was prosecuted, but minor repairs were made to buildings and ponds.

The program to enlarge the pond system at the Fort Worth (Tex.) station was continued during the year. This unit now has 20 ponds embracing a total area of approximately 35 acres. From the ponds that could be used more than 279,000 fingerling black bass, warmouth bass, crappie, bream, and channel catfish were collected and distributed. The production of channel catfish, which is one of the more difficult species of warm-water fishes to handle artificially, was very gratifying.

Minor repairs necessary to the maintenance and operation of the station were made at the Tishomingo (Okla.) hatchery. Five species of pondfishes were handled, comprising largemouth black bass, bluegill sunfish, green sunfish, crappie, and catfish. The local demand for panfish is much greater than for other species. An average of 17,000 fingerling fish per acre of water accounted for a total production of slightly less than 700,000 fish. Bream are propagated in conjunction with bass and crappie. The control of predatory animals and birds presents one of the major problems at this station.

New major construction projects were not undertaken at the Marion (Ala.) station during the year. Holding house No. 2, however, which was under construction at the close of last year, was completed and equipped with an electric pump for filling distribution receptacles, and a gasoline pumping unit was installed in holding house No. 1 to assist in areating the water in the holding tanks and to facilitate the filling of distribution pails. All buildings were wired for electric current. Adverse weather conditions during the height of the bass spawning season greatly reduced the production of that species. Although the total output was below last year's, a production of approximately 5,000 fingerlings per acre of water was obtained. The production of bream was not noticeably affected by the unfavorable weather. Breeding stocks of both largemouth black bass and bream were supplied to the units at Elkmont, Ala., Cohutta and Warm Springs, Ga., and Tupelo, Miss. As usual, the Alabama Department of Conservation and the Georgia Department of Natural Resources assisted in the transportation of fish for the stocking of waters in their respective areas. The cooperation of these departments kept the expense of distribution to a minimum, thereby enabling the station to expend its funds for fish production.

The Carbon Hill (Ala.) station was incomplete at the end of the year. Seven of the fourteen ponds originally planned have been finished and four more are approximately 50 percent completed. Two wells were drilled to supply water for the ponds and domestic use. This unit is being constructed largely under the auspices of W. P. A.

There was no construction or repairs to station buildings at Tupelo, Miss., during the year. The subzero weather experienced during the winter caused the loss of approximately 1,200 of the station's bream brood stock, and these fish were replaced with adult bream from the Marion (Ala.) hatchery. All ponds are stocked with both bass and bream and the results obtained from this type of propagation have been very satisfactory, as is proved by a production of 35,693 fingerling largemouth black bass and 15,836 fingerling bream per acre; a total output of 51,529 fingerlings per acre of water.

The Lyman (Miss.) station distributed a total of 332,990 fingerling bass and 840,500 fingerling bream for the stocking of Mississippi and Louisiana waters. The cost of production at this station is very low, due to an abundance of natural food. The fresh-water shrimp which were planted as forage in 1938 and 1939 are apparently increasing, even in the brood-stock holding pond. Nocturnal insects, attracted by lights which have been placed near the surface of the water, are a promising source of auxiliary food for fingerling bass. Shrimp heads, a local waste product, are secured free of cost and are proving very satisfactory as a pond fertilizer. Construction at this unit was largely limited to repairing and general conditioning of levees, roads, and fences. An all-weather road around the ponds was constructed by treating the main levee roads with oystershells. Giant bamboo and bamboo cane were planted to serve as windbreaks for the ponds, and black locust, kudsu, honeysuckle, and wisteria were planted at needed points for erosion control.

The Cohutta (Ga.) station produced five species of pondfishes this season; namely, largemouth and smallmouth black bass, Kentucky bass, bream, and catfish. A total of 65,800 fry and 181,055 fingerlings were distributed. As both bass and bream are stocked in the same ponds, no statistics are available for separate production. No new ponds were constructed at this station, but the bottoms of ponds Nos. 1, 2, 3, and 5 were graded to give the proper slope for drainage. The holding shed and the spring house were wired for electricity.

In view of the extensive construction work in progress at the Warm Springs (Ga.) unit, a number of the ponds could not be used. From those available, however, approximately 273,000 largemouth black bass and bream were produced, which were largely distributed by the Department of National Resources of Georgia. In addition to excavating a fish-exhibit pool of approximately one-third acre, and a rearing pond of the same size, extensive changes were made in the pond system. A number of the ponds were subgraded and the bottoms of two were completely reversed as to grade. New dikes were built and existing ones were raised and widened. Seventeen concrete outlets with necessary drain lines of terra cotta pipe were installed. A new fish-holding shed 29 ft. 6 in. by 25 ft. 6 in. was constructed. Cottage No. 2 was remodeled, and two toilets were installed in the office building. Considerable filling and landscaping around the station buildings was accomplished.

At the Lake Park (Ga.) hatchery the unusually warm weather in November and December caused the bream and crappie to continue spawning until December 15. As a result, the production was increased almost three-fold. The cost of production is very low, due to an abundance of natural food, and very little handling of brood stock or young. As has been the practice for a number of years, the State of Georgia distributed most of the fish produced. About 1,142,140 fish were distributed to applicants or planted in Georgia waters, and 99,360 were delivered for the stocking of Florida waters.

The Elk River (Ala.) hatchery, constructed by the T. V. A. primarily for the stocking of waters under its control, was taken under operating jurisdiction of the Bureau. Due to the necessity of treating the ponds with clay and bentonite to retard seepage, no fish were propagated. Brood stocks were collected for stocking the ponds when treatment is completed.

The hatchery at Norris, Tenn., was originally built for the purpose of propagating fish for stocking Norris Lake. However, production has increased to the point where Hiawassee and Chickamauga Lakes, of the T. V. A. system, also are being stocked. Because of the availability of C. C. C. labor, only one Bureau employee is stationed here. To preclude the introduction of foreign diseases or parasites into Norris Lake, all brood stock for the hatchery is collected locally. Crappie were propagated for the first time this year. The 500,000 pikeperch fry resulting from 580,000 eggs received from the Put in Bay (Ohio) station were planted in Hiawassee and Chickamauga Lakes.

The Louisville (Ky.) unit continued the practice of propagating five species of warm-water fish; smallmouth black bass, largemouth black bass, rock bass, crappie, and sunfish. In addition to these species, blackhead minnows and golden shiners were propagated as forage food for the fish. Due to adverse weather conditions during the spawning season, the output of bass fry was far below normal. Enough fry were obtained, however, to stock the rearing ponds and assign several thousand to the State of Kentucky for its rearing units. The two ponds under construction at the close of the fiscal year 1939 were completed.

The Harrison Lake (Va.) unit propagated three species of pondfishes in addition to its shad operations; largemouth black bass, bream, and crappie, with normal production. Enough daphnia were produced to furnish an ample supply of food for the bass fry.

At the Marianna (Fla.) station the majority of the ponds were drained earlier than usual in order to treat them with bentonite in an endeavor to decrease the loss of water through seepage. Cold weather occurring during the bass spawning season caused an abnormal loss of eggs, thereby curtailing the production of bass. The output of bream and crappie was normal, since they did not spawn until after the cold weather. Two crops of bream are produced here each year and two crops of largemouth black bass are possible. This station produced 21,597 largemouth bass and 50,070 bream per acre. An abundance of daphnia and natural food was produced in the rearing ponds by fertilization with from 500 to 1,000 pounds stable manure per acre during the season.

In addition to the work necessary for the maintenance of the hatchery property, three new ponds of 2 acres each were constructed at the Natchitoches (La.) station, and excavation was begun on a fourth pond. Due to unusual fluctuations in water temperatures in the ponds at spawning time, the largemouth black bass hatch was only about 50 percent of normal. It also is probable that the crappie production was similarly curtailed, since they began spawning about the same time as the bass. Due to the brevity of the experiment and the cold weather during spawning season this spring, no definite conclusions can be reached on the attempt to rear gizzard shad as forage for the bass. Notwithstanding the adverse conditions, 725,870 fingerlings were distributed during the year for the stocking of Louisiana, Texas, and Arkansas waters.

Even though the Mammoth Spring (Ark.) station produced a record output of smallmouth black bass last year, the production for the current year shows a gain of approximately 10 percent for this species, and an average output of the other spiny-rayed fish handled. Minnows and crayfish constituted the chief food for the brood stock, and daphnia was cultured for the fry and small fingerlings. The conservation departments of Arkansas, Missouri, Illinois, and Idaho received smallmouth black bass fry from this unit. The Arkansas Game and Fish Commission aided materially with the distribution of fish within that State. The fuel house and garage floor were repaired; the fuel house, residence, and pump house were painted; and the tank house was reroofed.

Four species of pondfish were propagated at the Edenton (N. C.) unit. Sunfish stocked with the largemouth black bass furnished forage for the young bass and sufficient fingerlings to supply the local requirements. Although the crappie production was somewhat below last year's, the total number of pondfish was about 15 percent above the 1939 output. Daphnia were cultured as food for the small fish. In addition to pondfish, yellow perch, white perch, shad, striped bass, and herring were propagated. This work is discussed under the heading "Anadromous Species, Atlantic Coast."

The Valley City (N. Dak.) hatchery, which is under construction, was sufficiently complete to stock five species of warm-water fishes in the brood ponds. Due to adverse conditions, the production of largemouth bass fry was light. Bream and crappie were still spawning at the close of the fiscal year. Pike, pickerel, and pikeperch fry were secured from the State of North Dakota and placed in rearing ponds for fall distribution. The construction work is practically complete. A holding house 30 by 30 feet, a pump house 10 by 14 feet, and 9 pond-outlet kettles and gates were completed during the year in addition to grading, riprapping, and seeding dikes.

Owing to a shortage of water in the early fall of 1939, the Orangeburg (S. C.) hatchery lost many of its breeders and a large number of young fish. Consequently, the production for the fiscal year of 1940 was approximately 21 percent less than for 1939, although it was above the yearly average. The total ouptut was 792,090 fish, which is a production of 29,067 per acre. Shad were not handled at the Jacksonboro (S. C.) shad hatchery this year because the eggs were not obtainable on a salvage basis.

The number of fish produced this year at the Hoffman (N. C.) station was only 60 percent of last year's production, due largely to the fact that this station has adopted the policy of distributing larger fish. This station has 23 one-acre ponds completed and four under construction. Two of the new ponds are complete except for the outlet boxes and the other two are approximately 80 percent excavated. Facilities for drainage of grounds and ponds were improved, and minor repairs were made to the buildings. The barn was razed and the lumber stored for future use. Pine straw was used to cover the bottoms of two nursery ponds to a depth of a few inches, wheat straw was used on another, and a fourth was covered with broomsedge sod. The ponds thus treated produced more fish of a uniform size than those that were fertilized with cottonseed meal alone.

## UPPER MISSISSIPPI RIVER WILDLIFE AND FISH REFUGE

Owing to completion of the system of flood-control dams along the Mississippi River, and the 9-foot navigation channel, fish-rescue work has been reduced to a small fraction of its former importance. There is a continuing need for rescue work, however, as management of the storage pools causes certain areas to be flooded, and pools remain which will trap some fish. Only 4,333,535 fish were rescued this year. All species indigenous to the Mississippi River were represented in these collections, but catfish comprised one-third of the total. Rescue work was carried on at Marquette, Guttenberg, Bellevue, and Fairport, Iowa. No rescue work was done by the Genoa (Wis.) station or the Homer (Minn.) unit.

Three large ponds were in production at the Guttenberg station, which produced a total of 1,260,170 fingerling and adult fish. More than 1 million of these were catfish. In addition to the pondfishes, buffalofish and northern pike were incubated in the hatchery. High water delayed the construction work on some of the ponds at Guttenberg. However, three ponds were partially completed and can be placed in production in the near future.

The La Crosse (Wis.) station is the headquarters for all the upper Mississippi River fisheries and rescue work. In addition to these activities, trout and pondfishes are propagated and many cooperative nurseries in Wisconsin, Minnesota, and Illinois are supervised. In Minnesota there was a total of 12 cooperative ponds with 8 sponsoring units, and in Wisconsin a total of 44 ponds, representing 29 separate agencies. A high percentage of fish delivered to each agency in the spring are planted each fall. Both the Northside station at La Crosse and the auxiliary unit at Lynxville were used during the spring to relieve congested conditions at the La Crosse hatchery. The hatchery pond at La Crosse produced 162,390 fingerling largemouth black bass (37,188 per acre).

Because of a cold wave following warm spawning weather, the year's production of largemouth black bass eggs in pond No. 1 (about 35 acres in area) at the Genoa (Wis.) station was practically a total loss. Consequently, only a few early deliveries of fingerlings were made. Fry produced in other ponds were transferred to pond No. 1 for rearing and subsequent distribution. Three additional ponds with a total area of approximately 12 acres were stocked with smallmouth black bass, one 4-acre pond was stocked with sunfish, and another pond with crappie. Three new ponds having an area of approximately four acres each were constructed during the year. They complete the system of ponds north of the Bad Axe River. Extensive changes were made in two older ponds.

The personnel of the Homer (Minn.) unit was engaged in general repair work for all stations in the central district. Portable equipment such as nets, seines, rowboats, small engines and motors, and standard forms for concrete and cement work were constructed or repaired. Both efficiency and economy result from such a practice when the work is sufficient to require full-time service of the mechanics, as is now the case.

*Number and disposition of fish rescued, fiscal year 1940*

| Locality and species | Delivered to applicants | Restored to original waters | Total number of fish |
|---|---|---|---|
| All stations: | | | |
| Black bass | 5,600 | 21,450 | 27,050 |
| Crappie | 7,490 | 866,425 | 873,915 |
| Sunfish | 71,915 | 999,500 | 1,071,415 |
| Catfish | | 1,496,360 | 1,496,360 |
| Yellow perch | | 2,200 | 2,200 |
| Pike-pickerel | | 8,250 | 8,250 |
| Buffalofish | | 356,600 | 356,600 |
| White bass | | 27,745 | 27,745 |
| Drum | | 5,000 | 5,000 |
| Miscellaneous fishes | | 465,000 | 465,000 |
| Total | 85,005 | 4,248,530 | 4,333,535 |
| Summary by stations: | | | |
| Marquette, Iowa | 30,620 | 903,300 | 933,920 |
| Guttenberg, Iowa | 38,185 | 1,290,935 | 1,329,120 |
| Bellevue, Iowa | 16,200 | 1,650,850 | 1,667,050 |
| Fairport, Iowa | | 403,445 | 403,445 |
| Total | 85,005 | 4,248,530 | 4,333,535 |

## AQUARIUM

While no major changes in equipment or operations were effected in the Aquarium during the year, the periodical acquisition of new specimens stimulated a continuing public interest in the displays. As usual most of the exhibit fishes were obtained from the Bureau's hatcheries, and a carload shipment was received from the Mississippi River during the late fall.

A new type of illuminated colored sign was installed on some of the tanks. Due to the frequent changing of exhibits it is necessary to develop some sort of sign which will be readily interchangeable. Shad eggs and trout eggs from local hatcheries, and salmon eggs from the West coast were shown under incubation in the miniature demonstration hatchery. An average of about 1,500 specimens, including the small fingerlings which are reared at the aquarium, were on display daily during the year. Shipments of rare golden trout, and of lake trout in the fingerling stage were received.

It may be pointed out that the Aquarium in the Department of Commerce Building is not the only public aquarium operated by the Bureau. At Woods Hole, Mass., and Boothbay Harbor, Maine, salt-water fish were shown during the summer months. At La Crosse and Lake Mills, Wis., Louisville, Ky., and Welaka, Fla., a considerable number of fresh-water species were exhibited. All fish hatcheries are in the nature of aquaria, since the public is enabled to view live fish at any period of the year, and the plans for some of the new hatchery developments include special tanks for display purposes.

## DISTRIBUTION OPERATIONS

Requests for allotments of fish to restock waters were received from individuals and sportsmen's organizations in greater numbers this year than for several previous years—the total being 13,146. This number does not include applications received from the Forest Service, National Park Service, and other Federal agencies, which requests were given priority.

The trend is constantly toward the use of trucks for distribution work, especially for trips within a radius of approximately 300 miles of the hatchery. At the present time fish cars are used only for the longer hauls. During the year fish-delivery trucks traveled a total of 367,985 miles. This figure does not include travel by trucks owned by State conservation departments, national forests and parks, etc., which were used to assist in distributing the production of Federal hatcheries.

Fish-distribution cars, which were engaged in delivering fish to applicants and transferring fish between hatcheries, made 57 trips this year and carried an average of 260 pails per trip. The cars traveled 32,048 paid miles and 12,344 free miles. Detached messengers traveled 50,325 paid miles and 7,263 free miles in delivering fish to applicants. As usual, the Bureau received either free transportation or reduced rates from a number of the railroads.

Decentralizing the distribution service by establishing a field office at La Crosse, Wis., has greatly expedited distribution activities, especially in the Central States. As soon as funds become available, it is the expectation to decentralize the distribution service further by placing experienced employees at various central points. This will not only facilitate the handling of distribution, but will enable the Bureau to work in closer cooperation with the State conservation departments and at the same time reduce distribution costs.

*Summary, by States, of the distribution of fish, fiscal year 1940*

| State and species | Number |
|---|---|
| Alabama: | |
| Largemouth black bass | 482, 315 |
| Smallmouth black bass | 125 |
| Crappie | 3, 140 |
| Rainbow trout | 9, 600 |
| Rock bass | 2, 935 |
| Sunfish | 805, 585 |
| Arizona: Largemouth black bass | 50, 000 |
| Arkansas: | |
| Largemouth black bass | 142, 375 |
| Smallmouth black bass | 101, 125 |
| Catfish | 70 |
| Rainbow trout | 2, 250 |
| Rock bass | 21, 500 |
| Sunfish | 148, 200 |
| California: Chinook Salmon | 5, 565, 490 |
| Colorado: | |
| Largemouth black bass | 5, 710 |
| Blackspotted trout | 1, 139, 820 |
| Brook trout | 1, 710, 280 |
| Catfish | 8, 400 |
| Crappie | 5, 040 |
| Lake trout | 21, 700 |
| Loch Leven trout | 90, 885 |
| Rainbow trout | 1, 078, 605 |
| Rock bass | 8, 700 |
| Steelhead trout | 20, 580 |
| Sunfish | 8, 400 |
| Connecticut: | |
| Smallmouth black bass | 303, 000 |
| Brook trout | 70, 000 |
| Rainbow trout | 1, 000 |
| Delaware: Largemouth black bass | 330 |
| Florida: | |
| Largemouth black bass | 926, 495 |
| Smallmouth black bass | 1, 250 |
| Catfish | 500 |
| Crappie | 39, 300 |
| Sunfish | 640, 285 |
| Georgia: | |
| Largemouth black bass | 473, 680 |
| Smallmouth black bass | 7, 675 |
| Brook trout | 60, 740 |
| Catfish | 14, 420 |
| Crappie | 361, 200 |
| Kentucky bass | 12, 140 |
| Rainbow trout | 58, 025 |
| Sunfish | 921, 615 |
| Idaho: | |
| Largemouth black bass | 400 |
| Smallmouth black bass | 6, 000 |
| Blackspotted trout | 1, 028, 810 |
| Brook trout | 572, 635 |
| Golden trout | 11, 140 |
| Grayling | 51, 000 |
| Landlocked sockeye salmon | 650, 590 |
| Rainbow trout | 1, 007, 915 |
| Sunfish | 125 |
| Illinois: | |
| Largemouth black bass | 40, 650 |
| Smallmouth black bass | 60, 600 |
| Brook trout | 1, 200 |
| Buffalofish | 324, 000 |
| Catfish | 133, 900 |
| Crappie | 286, 200 |
| Loch Leven trout | 20, 900 |
| Miscellaneous fishes | 454, 000 |
| Sunfish | 747, 150 |
| Indiana: | |
| Largemouth black bass | 181, 130 |
| Smallmouth black bass | 21, 955 |
| Brook trout | 151, 700 |
| Catfish | 5, 450 |
| Crappie | 2, 865 |
| Loch Leven trout | 174, 600 |
| Rainbow trout | 159, 015 |
| Rock bass | 92, 250 |
| Sunfish | 428, 100 |
| Yellow perch | 53, 070 |
| Iowa: | |
| Largemouth black bass | 198, 415 |
| Smallmouth black bass | 5, 840 |
| Brook trout | 53, 800 |
| Buffalofish | 118, 400 |
| Catfish | 2, 485, 425 |
| Crappie | 649, 480 |
| Drum | 6, 600 |
| Loch Leven trout | 5, 645 |
| Miscellaneous fishes | 11, 000 |
| Pike and pickerel | 718, 915 |
| Rainbow trout | 80, 790 |
| Rock bass | 3, 000 |
| Sunfish | 813, 375 |
| White bass | 30, 745 |
| Yellow perch | 2, 250 |
| Kansas: | |
| Largemouth black bass | 12, 800 |
| Catfish | 945 |
| Crappie | 19, 075 |
| Rainbow trout | 2, 700 |
| Sunfish | 4, 225 |
| Kentucky: | |
| Largemouth black bass | 38, 910 |
| Smallmouth black bass | 96, 785 |
| Crappie | 2, 360 |
| Loch Leven trout | 300 |
| Rock bass | 12, 350 |
| Sunfish | 24, 125 |
| Yellow perch | 420 |
| Louisiana: | |
| Largemouth black bass | 132, 700 |
| Catfish | 520 |
| Crappie | 675 |
| Sunfish | 477, 300 |
| Warmouth bass | 11, 360 |
| Maine: | |
| Smallmouth black bass | 70, 000 |
| Brook trout | 284, 915 |
| Flounder | 612, 900, 000 |
| Lake trout | 7, 500 |
| Lobster | 7, 532, 000 |
| Rainbow trout | 100 |
| Maryland: | |
| Largemouth black bass | 6, 530 |
| Smallmouth black bass | 1, 340 |
| Brook trout | 3, 340 |
| Crappie | 800 |
| Loch Leven trout | 9, 000 |
| Rainbow trout | 40, 795 |
| Shad | 27, 920, 000 |
| Sunfish | 10, 825 |
| Yellow perch | 4, 260, 000 |
| Massachusetts: | |
| Smallmouth black bass | 105, 575 |
| Brook trout | 204, 020 |
| Catfish | 12, 440 |
| Cod | 191, 980, 105 |
| Flatfish | 63, 556, 285 |
| Lobster | 552, 000 |
| Loch Leven trout | 280 |
| Mackerel | 8, 277, 000 |
| Pollock | 174, 382, 605 |
| Rainbow trout | 27, 795 |
| Michigan: | |
| Largemouth black bass | 35, 965 |
| Smallmouth black bass | 20, 165 |
| Brook trout | 403, 445 |
| Crappie | 400 |
| Lake trout | 1, 381, 500 |
| Loch Leven trout | 2, 500 |
| Rainbow trout | 86, 610 |
| Rock bass | 195 |
| Steelhead trout | 22, 200 |
| Sunfish | 80, 415 |
| Whitefish | 1, 200, 000 |
| Yellow perch | 2, 500 |

*Summary, by States, of the distribution of fish, fiscal year 1940*—Continued

| State and species | Number |
|---|---|
| Minnesota: | |
| Largemouth black bass | 168,875 |
| Smallmouth black bass | 7,200 |
| Brook trout | 740,250 |
| Crappie | 8,240 |
| Lake herring | 280,000 |
| Lake trout | 376,000 |
| Loch Leven trout | 152,500 |
| Pikeperch | 6,950,000 |
| Pike and pickerel | 200,000 |
| Rainbow trout | 96,025 |
| Sunfish | 24,680 |
| Mississippi: | |
| Lakemouth black bass | 835,450 |
| Catfish | 7,000 |
| Crappie | 300 |
| Sunfish | 1,155,035 |
| Missouri: | |
| Largemouth black bass | 196,545 |
| Smallmouth black bass | 209,700 |
| Catfish | 8,130 |
| Crappie | 45,505 |
| Rainbow trout | 74,780 |
| Rock bass | 15,200 |
| Sunfish | 87,620 |
| Montana: | |
| Largemouth black bass | 6,550 |
| Blackspotted trout | 4,033,065 |
| Brook trout | 835,395 |
| Catfish | 90,090 |
| Crappie | 45,825 |
| Golden trout | 8,715 |
| Grayling | 194,250 |
| Loch Leven trout | 1,404,480 |
| Rainbow trout | 1,243,705 |
| Sunfish | 6,935 |
| Nebraska: | |
| Largemouth black bass | 7,900 |
| Brook trout | 55,675 |
| Catfish | 24,400 |
| Crappie | 12,020 |
| Loch Leven trout | 12,000 |
| Rainbow trout | 219,970 |
| Sunfish | 29,475 |
| Yellow perch | 2,100 |
| Nevada: | |
| Largemouth black bass | 56,000 |
| Blackspotted trout | 57,000 |
| Brook trout | 25,000 |
| Rainbow trout | 199,225 |
| Sunfish | 18,000 |
| New Hampshire: | |
| Smallmouth black bass | 6,000 |
| Brook trout | 289,360 |
| Catfish | 1,400 |
| Rainbow trout | 600 |
| New Jersey: | |
| Largemouth black bass | 6,445 |
| Smallmouth black bass | 400 |
| Catfish | 300 |
| Crappie | 240 |
| Sunfish | 3,700 |
| Yellow perch | 470 |
| New Mexico: | |
| Largemouth black bass | 869,455 |
| Smallmouth black bass | 52,950 |
| Blackspotted trout | 189,000 |
| Catfish | 26,750 |
| Crappie | 82,850 |
| Rainbow trout | 241,500 |
| Sunfish | 397,450 |
| New York: | |
| Largemouth black bass | 21,020 |
| Smallmouth black bass | 212,175 |
| Brook trout | 437,640 |
| Catfish | 1,800 |
| Crappie | 1,590 |
| Flounder | 73,666,000 |
| Lake herring | 140,000 |
| Lake trout | 202,940 |
| Loch Leven trout | 202,335 |
| New York—Continued. | |
| Rainbow trout | 110,720 |
| Rock bass | 2,000 |
| Sunfish | 2,800 |
| Whitefish | 4,460,000 |
| Yellow perch | 1,800 |
| North Carolina: | |
| Largemouth black bass | 677,890 |
| Smallmouth black bass | 2,750 |
| Brook trout | 177,765 |
| Catfish | 25 |
| Crappie | 10,765 |
| Glut herring | 170,000 |
| Loch Leven trout | 9,910 |
| Pikeperch | 225,000 |
| Rainbow trout | 140,920 |
| Shad | 13,150,000 |
| Striped bass | 5,917,000 |
| Sunfish | 404,925 |
| Warmouth bass | 13,000 |
| White perch | 2,280,845 |
| Yellow perch | 1,222,535 |
| North Dakota: | |
| Largemouth black bass | 1,150 |
| Catfish | 6,120 |
| Crappie | 4,320 |
| Loch Leven trout | 16,000 |
| Rainbow trout | 4,000 |
| Sunfish | 1,300 |
| Ohio: | |
| Largemouth black bass | 70,010 |
| Smallmouth black bass | 740 |
| Brook trout | 7,500 |
| Catfish | 1,320 |
| Loch Leven trout | 23,000 |
| Pikeperch | 1,250,000 |
| Rainbow trout | 76,100 |
| Rock bass | 10,650 |
| Sunfish | 147,660 |
| Oklahoma: | |
| Largemouth black bass | 135,520 |
| Catfish | 520 |
| Crappie | 11,050 |
| Rainbow trout | 375 |
| Sunfish | 506,505 |
| Oregon: | |
| Brook trout | 154,090 |
| Chinook salmon | 1,738,060 |
| Rainbow trout | 641,135 |
| Silver salmon | 57,445 |
| Steelhead trout | 712,625 |
| Pennsylvania: | |
| Largemouth black bass | 10,520 |
| Smallmouth black bass | 7,320 |
| Brook trout | 431,045 |
| Catfish | 7,890 |
| Loch Leven trout | 398,150 |
| Rainbow trout | 238,895 |
| Sunfish | 18,215 |
| Yellow perch | 180 |
| Rhode Island: Flatfish | 11,403,000 |
| South Carolina: | |
| Largemouth black bass | 594,515 |
| Brook trout | 49,945 |
| Catfish | 23,400 |
| Crappie | 1,300 |
| Loch Leven trout | 2,975 |
| Rainbow trout | 47,835 |
| Sunfish | 215,855 |
| Warmouth bass | 1,645 |
| Yellow perch | 2,880 |
| South Dakota: | |
| Largemouth black bass | 6,925 |
| Blackspotted trout | 64,000 |
| Brook trout | 321,010 |
| Catfish | 35,300 |
| Crappie | 26,560 |
| Loch Leven trout | 19,985 |
| Rainbow trout | 251,820 |
| Sunfish | 28,955 |

*Summary, by States, of the distribution of fish, fiscal year 1940*—Continued

| State and species | Number |
|---|---|
| Tennessee: | |
| Largemouth black bass | 735, 605 |
| Smallmouth black bass | 290 |
| Brook trout | 36, 020 |
| Kentucky bass | 26, 150 |
| Loch Leven trout | 2, 340 |
| Miscellaneous fishes | 2, 000 |
| Pikeperch | 275, 000 |
| Rainbow trout | 743, 895 |
| Rock bass | 19, 770 |
| Sunfish | 188, 425 |
| Texas: | |
| Largemouth black bass | 1, 902, 570 |
| Catfish | 16, 255 |
| Crappie | 32, 110 |
| Loch Leven trout | 5, 225 |
| Rio Grande perch | 96, 310 |
| Rock bass | 5, 310 |
| Sunfish | 1, 201, 515 |
| Warmouth bass | 11, 500 |
| Utah: | |
| Largemouth black bass | 1, 500 |
| Blackspotted trout | 1, 066, 120 |
| Brook trout | 386, 025 |
| Chum salmon | 120, 680 |
| Lake trout | 19, 825 |
| Loch Leven trout | 16, 845 |
| Rainbow trout | 486, 250 |
| Sunfish | 21, 000 |
| Vermont: | |
| Largemouth black bass | 20, 300 |
| Smallmouth black bass | 50, 000 |
| Brook trout | 916, 525 |
| Landlocked salmon | 15, 645 |
| Loch Leven trout | 42, 140 |
| Rainbow trout | 8, 310 |
| White perch | 1, 000 |
| Virginia: | |
| Largemouth black bass | 349, 840 |
| Smallmouth black bass | 51, 505 |
| Brook trout | 200, 265 |
| Crappie | 14, 680 |
| Pikeperch | 300, 000 |
| Rainbow trout | 293, 260 |
| Rock bass | 5, 550 |
| Shad | 672, 500 |
| Virginia—Continued. | |
| Sunfish | 244, 670 |
| Yellow perch | 237, 600, 000 |
| Washington: | |
| Largemouth black bass | 6, 000 |
| Blackspotted trout | 845, 780 |
| Brook trout | 905, 250 |
| Chinook salmon | 31, 803, 275 |
| Chum salmon | 4, 567, 200 |
| Crappie | 7, 200 |
| Humpback salmon | 467, 790 |
| Rainbow trout | 950, 105 |
| Silver salmon | 1, 436, 325 |
| Sockeye salmon | 2, 279, 125 |
| Steelhead trout | 1, 074, 535 |
| West Virginia: | |
| Largemouth black bass | 14, 755 |
| Smallmouth black bass | 23, 805 |
| Blackspotted trout | 11, 590 |
| Brook trout | 25, 120 |
| Catfish | 1, 125 |
| Crappie | 80 |
| Loch Leven trout | 35, 735 |
| Rainbow trout | 163, 365 |
| Sunfish | 8, 910 |
| Wisconsin: | |
| Largemouth black bass | 781, 260 |
| Smallmouth black bass | 10, 800 |
| Brook trout | 834, 440 |
| Catfish | 8, 015 |
| Crappie | 12, 200 |
| Loch Leven trout | 288, 800 |
| Rainbow trout | 238, 250 |
| Sunfish | 137, 900 |
| Wyoming: | |
| Largemouth black bass | 7, 085 |
| Blackspotted trout | 10, 092, 580 |
| Brook trout | 863, 790 |
| Catfish | 38, 000 |
| Crappie | 4, 860 |
| Grayling | 2, 857, 990 |
| Lake trout | 13, 700 |
| Loch Leven trout | 73, 600 |
| Rainbow trout | 1, 131, 505 |
| Rock bass | 5, 180 |
| Sunfish | 13, 400 |
| Yellow perch | 1, 245 |

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